Subjek : Pengolahan Pangan
Tahun 2004-2008 (1.000 judul)

K.R. Vijayakumar, Asha Martin, Lalitha R. Gowda, V. Prakash, Detection of genetically modified soya and maize: Impact of heat processing, Food Chemistry, Volume 117, Issue 3, 1 December 2009, Pages 514-521, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.04.028.
(http://www.sciencedirect.com/science/article/B6T6R-4W3PT8H-4/2/7111c6f94a5dffc53f812302fca16bf1)
Abstract:
The analysis of processed foods entails a number of complications, which negatively affect the performance of DNA based detection methods. Heat-processing methods viz. autoclaving and micro-waving, that mimic processing and manufacturing, as model unit operation systems were used to study their effect on the detection of genetically modified organisms (GMOs). This study confirms the premise that high temperature and/or pressure significantly reduce the level of detectable DNA. PCR methods were developed and adapted to target varying amplicon sizes of the trait, construct and event specific gene sequences that occur in MON-810 maize and Roundup Ready(R) soybean. Integrity of DNA, recovery and PCR amplicon size (<200 bp) are major factors that direct the successful detection of GMOs in processed foods. The model systems used provide a platform to devise better strategies in developing detection protocols, especially for processed foods containing GMOs.
Keywords: Amplicon size; DNA degradation; Food processing; Genetically modified organisms; Polymerase chain reaction

Yu-Zhen Ding, Shao-Ying Zhang, Peng Liu, Wenqiao Yuan, Jin-Yi Liang, Zhe Zhao, Yu-Dong Zhang, Microbiological and biochemical changes during processing of the traditional chinese food douzhi, Food Control, Volume 20, Issue 12, December 2009, Pages 1086-1091, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.02.005.
(http://www.sciencedirect.com/science/article/B6T6S-4VNH3TD-3/2/63b9c825be444d157e25d538dc27efed)
Abstract:
The microbiological and biochemical changes during douzhi processing were studied. The sedimentation process was shown to follow a lactic fermentation course. The main fermenting bacteria were identified to be Lactococcus lactis and Leuconostoc citreum; the former played the main role in producing acids, and the latter ensured a better flavor of douzhi. Yeasts thrived during the late part of fermentation were believe to account for the decrease in acidity. Tracing the change of chemical compounds suggested that active metabolic activity was induced when beans were steeped in water, in which significant reduction in crude protein and sugars were observed, but levels of soluble proteins, free amino acids increased. Fermentation by lactic acid bacteria caused a rapid reduction of soluble proteins, soluble sugars and reducing sugars, but significant accumulation of free amino acids and slight changes in crude protein. Mung bean endogenous protease and amylase activity dropped significantly during fermentation.
Keywords: Mung bean; Lactococcus lactis; Leuconostoc citreum

L. Fillaudeau, K. Le-Nguyen, C. Andre, Influence of flow regime and thermal power on residence time distribution in tubular Joule Effect Heaters, Journal of Food Engineering, Volume 95, Issue 3, December 2009, Pages 489-498, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.06.010.
(http://www.sciencedirect.com/science/article/B6T8J-4WH2KV3-4/2/737f646d485df7340a2f5a6b570485da)
Abstract:

To improve treatment homogeneity in tubular Joule Effect Heater (JEH), geometric modifications could be used even in laminar regime inducing flow perturbation and mixing.As a response variable, residence time distribution (RTD) is an important parameter and it has been commonly used in determining the performances of industrial heat exchangers.In present work, our objectives were (i) to investigate the impact of processing conditions (flow regime, heat flux) on RTD in an industrial JEH equipped with smooth and modified tubes, (ii) to contribute to the estimation of treatment homogeneity versus global energetic performances of heat exchanger and (iii) to validate a general reactor model.Analytical solution and systemic analysis of RTD signals were reported.The evolutions of mean reduced variance, [beta]2 against efficiency number, Eff for smooth ([beta]2 = 0.00129 [middle dot] Eff - 0.0300, R2 = 0.992) and modified ([beta]2 = 0.000547 [middle dot] Eff - 0.0169, R2 = 0.979) tubes exhibited a similar and linear relationship.Under the conditions investigated (38 < Re < 10,000, 4 < Pr < 950 with Newtonian fluids), treatment homogeneity was significantly improved by modified geometry and strong interactions between heat transfer and hydrodynamics.A significant decrease in reduced variance under both laminar , and turbulent , regimes was observed versus heat energy.However geometric modification and heat treatment affected the residence time distribution and specifically reduced variance, [beta]2 within same order of magnitude.Systemic analysis of experimental data enabled to evaluate two reactor models:Dispersed Plug Flow (DPF) and Plug Flow (PF) + 2 Continuous Stirred Tank Reactor (CSTR) with and without convolution and with 1 or 2 degrees of freedom.Second model could be considered as the most accurate model to predict RTD in JEH with an accurate degree of confidence for residence time and reduced variance estimation ([tau] = 0.995 [middle dot] ts R2 = 0.64, error < 3% and) and a simplified model with only 1 degree of freedom can be used.
Keywords: RTD; Joule Effect Heater; Food process; Flow regime; Heat treatment; Newtonian fluid

Umran Uygun, Berrin Senoz, Serpil Ozturk, Hamit Koksel, Degradation of organophosphorus pesticides in wheat during cookie processing, Food Chemistry, Volume 117, Issue 2, 15 November 2009, Pages 261-264, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.03.111.
(http://www.sciencedirect.com/science/article/B6T6R-4W0WJB9-C/2/c132d25e8fe9c0a47f1b1e57cb376940)
Abstract:
For investigating carryover of some organophosphorus pesticide residues in the cereal food chain from grain to consumer, a study was set up on wheat bran, flour and cookies, with and without bran. Special emphasis was given to malathion and chlorpyrifos-methyl residues in cookies for better protection of consumers. Pesticide-free wheat was placed in a small-scale model of a commercial storage vessel and treated with these pesticides. The residue levels of insecticides were determined in wheat, as well as in bran, flour and cookies produced from stored wheat at various time intervals during storage. A multiresidue analysis was performed using GC-NPD and GC-MS. Malathion and chlorpyrifos-methyl residue levels were higher than the maximum residue limits (MRLs) in wheat after 240 days of storage. MRLs established by the EC for malathion and chlorpyrifos-methyl in wheat are 8 and 3 mg kg-1, respectively. The residue levels of insecticides in flour samples also exceeded the MRL (2 mg kg-1 for both insecticides). Eight months of storage were not effective for reducing the residues in wheat to the levels below MRLs. Although, considerable amounts of the insecticides remained in the bran and flour, the cookie processing significantly reduced the concentrations in general. Chlorpyrifos-methyl was more persistent than was malathion and comparatively less degradation occurred during milling and cookie processing due to its physicochemical properties.
Keywords: Malathion; Chlorpyrifos-methyl; Wheat; Cookies

Dereje T. Asefa, Solveig Langsrud, Ragnhild O. Gjerde, Cathrine F. Kure, Maan S. Sidhu, Truls Nesbakken, Ida Skaar, The performance of SAS-super-180 air sampler and settle plates for assessing viable fungal particles in the air of dry-cured meat production facility, Food Control,

Volume 20, Issue 11, November 2009, Pages 997-1001, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.11.011.
(http://www.sciencedirect.com/science/article/B6T6S-4V42J5X-3/2/535dcf6d4d683123eb8ab3c6f993c442)
Abstract:
Performances of SAS-super-180 air sampler and settle plates were investigated for the assessment of airborne fungal food contamination. Air samples were taken from processing rooms of a dry-cured production facility and outdoors. Fungal colonies and numbers of species were counted and compared. Quantitatively, the air sampler showed higher numbers of species and mean CFU/plate compared to settle plates. Qualitatively, the two methods showed similar dominating fungal genera and species associated with dry-cured meat products. The study showed settle plates could provide important qualitative information for food processing plants where airborne fungi associated with food products are the targets.
Keywords: Air sampling; Dry-cured meat products; Viable fungal colonies

Adriano G. Cruz, Adriane E.C. Antunes, Ana Lucia O.P. Sousa, Jose A.F. Faria, Susana M.I. Saad, Ice-cream as a probiotic food carrier, Food Research International, Volume 42, Issue 9, November 2009, Pages 1233-1239, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.03.020.
(http://www.sciencedirect.com/science/article/B6T6V-4W0R0JF-2/2/891ed6b7a629c88e6fd09f0031a3632c)
Abstract:
Ice-creams are food products showing potential for use as probiotic vehicles, with the added advantage of being appreciated by people belonging to all age groups and social levels. However, the development of ice-creams containing probiotic bacteria requires the overcoming of certain technological intrinsic requirements related to their processing stages. The aim of the present paper was to review the technological parameters involved in the production of probiotic ice-creams. Although the application of probiotics in cheeses, and especially in fermented milks, has been widely explored in the literature, ice-cream is a relatively innovative matrix for the application of probiotics, and thus a review about its potential as probiotic food carrier could be very helpful.
Keywords: Ice-creams; Processing; Probiotics; Lactobacillus; Bifidobacterium

Lien Lemmens, Sandy Van Buggenhout, Indrawati Oey, Ann Van Loey, Marc Hendrickx, Towards a better understanding of the relationship between the [beta]-carotene in vitro bio-accessibility and pectin structural changes: A case study on carrots, Food Research International, Volume 42, Issue 9, November 2009, Pages 1323-1330, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.04.006.
(http://www.sciencedirect.com/science/article/B6T6V-4W2W5HH-1/2/1efecaa139febdc1286531ace1044315)
Abstract:
The quality of fruit and vegetables based products is affected by processing. Two important parameters to consider are the structural characteristics and the nutritional value. As pectin is a major constituent of plant cell walls, pectin structure engineering can be used as a tool to affect the structural quality of plant based food products. During thermal processing, pectin characteristics are influenced. Recently, it has been highlighted that nutrient bio-accessibility is affected by food structure. The intracellular localization of nutrients implies that their accessibility can be hindered by several structural elements.
Therefore, this investigation focused on the relation between the structural quality and the nutritional value of carrots. Texture was measured as an indication for the structural quality, while the [beta]-carotene in vitro bio-accessibility was selected as a parameter reflecting the nutritional value. The effect of thermal (pre)processing on this relationship was investigated. The results clearly indicate that the structural quality of carrots and the [beta]-carotene in vitro bio-accessibility

are inversely correlated. Moreover, it was hypothesized that pectin changes during thermal processing play a key role in this inverse relationship.
Keywords: [beta]-Carotene; Carrot; In vitro bio-accessibility; (Pre)processing; Structure

F. Sahena, I.S.M. Zaidul, S. Jinap, A.A. Karim, K.A. Abbas, N.A.N. Norulaini, A.K.M. Omar, Application of supercritical CO2 in lipid extraction - A review, Journal of Food Engineering, Volume 95, Issue 2, November 2009, Pages 240-253, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.06.026.
(http://www.sciencedirect.com/science/article/B6T8J-4WKK1F3-6/2/69483289b8e1a3bfa4478bebb813ba61)
Abstract:
Supercritical fluid extraction (SFE) offers an alternative method to conventional extraction of fatty acids. SFE was developed for analytical application in the mid-1980s in response to the desire to reduce the use of organic solvents in the laboratory environment, and it is now becoming a standard method for the extraction, fractionation, refinement and deodorization of lipids or essential oils containing sample matrices at the industrial scale. This paper reviews applications of supercritical fluid technology in fatty acid/lipid extraction using carbon dioxide. Carbon dioxide is an ideal supercritical fluid because of its environmentally benign, non-toxic, non-flammable, non-polluting, recoverable characteristics and its ability to solubilise lipophilic substances. A summary of commercial applications and examples of recent developments of SFE in the food processing industry are also reviewed.
Keywords: Supercritical CO2; Lipid; Fatty acid; Extraction method; Food application

Guy Metcalfe, Daniel Lester, Mixing and heat transfer of highly viscous food products with a continuous chaotic duct flow, Journal of Food Engineering, Volume 95, Issue 1, November 2009, Pages 21-29, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.04.032.
(http://www.sciencedirect.com/science/article/B6T8J-4W7J0SW-1/2/ead9467a8a393f03ef75844702ec5764)
Abstract:
We discuss the Rotated Arc Mixer (RAM) for continuous mixing and heat exchange of highly viscous foods. Principal advantages of the RAM are the simplicity of construction/disassembly and the attendant large energy savings due to the absence of internal elements. The absence of internal obstructions benefits the performance of the RAM in several ways. The geometry is amenable to in-depth analysis and is easier to scale up and optimize for specific applications. The absence of internals also has the benefit of making the RAM less susceptible to clogging and fouling, which can reduce downtime and maintenance cost. The RAM exploits chaotic advection to mix and transport heat in viscously dominated (low Reynolds number) flows. Among other things the RAM can effect good in-line mixing of viscous materials with a pressure drop that is the same as that of an open pipe; moreover, the RAM has several control parameters to tune the chaotic advection, making it flexible for applications. Examples are presented from confectionary and diary processing.
Keywords: Mixing; Heat transfer; Viscous; Non-Newtonian; Processing

David C. Sands, Cindy E. Morris, Edward A. Dratz, Alice L. Pilgeram, Elevating optimal human nutrition to a central goal of plant breeding and production of plant-based foods, Plant Science, Volume 177, Issue 5, November 2009, Pages 377-389, ISSN 0168-9452, DOI: 10.1016/j.plantsci.2009.07.011.
(http://www.sciencedirect.com/science/article/B6TBH-4WXSJW1-3/2/601109e9fa39fd8d28259b9dbfb0ef76)
Abstract:

High-yielding cereals and other staples have produced adequate calories to ward off starvation for much of the world over several decades. However, deficiencies in certain amino acids, minerals, vitamins and fatty acids in staple crops, and animal diets derived from them, have aggravated the problem of malnutrition and the increasing incidence of certain chronic diseases in nominally well-nourished people (the so-called diseases of civilization). Enhanced global nutrition has great potential to reduce acute and chronic disease, the need for health care, the cost of health care, and to increase educational attainment, economic productivity and the quality of life. However, nutrition is currently not an important driver of most plant breeding efforts, and there are only a few well-known efforts to breed crops that are adapted to the needs of optimal human nutrition. Technological tools are available to greatly enhance the nutritional value of our staple crops. However, enhanced nutrition in major crops might only be achieved if nutritional traits are introduced in tandem with important agronomic yield drivers, such as resistance to emerging pests or diseases, to drought and salinity, to herbicides, parasitic plants, frost or heat. In this way we might circumvent a natural tendency for high yield and low production cost to effectively select against the best human nutrition. Here we discuss the need and means for agriculture, food processing, food transport, sociology, nutrition and medicine to be integrated into new approaches to food production with optimal human nutrition as a principle goal.
Keywords: Breeder's dilemma; Plant genetic engineering; Biotechnology; Malnutrition; Plant pathology; Green revolution

Flora V. Romeo, Serena De Luca, Amalia Piscopo, Enzo Perri, Marco Poiana, Effects of post-fermentation processing on the stabilisation of naturally fermented green table olives (cv Nocellara etnea), Food Chemistry, Volume 116, Issue 4, 15 October 2009, Pages 873-878, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.03.037.
(http://www.sciencedirect.com/science/article/B6T6R-4VVR210-3/2/75d3f56e98b9c3f781541d4ab379a9ba)
Abstract:
The effects of thermal treatment on green table olives were evaluated as a method to control enzymatic browning, to minimise the microorganism presence and to extend their shelf-life. However this treatment is often responsible for colour alterations, development of off-flavours and unfavourable texture changes. Moreover, the effect of different re-use of the natural brine of fermentation with or without different treatments was investigated. Calcium treatment was suggested to maintain firmness. Firming effects obtained from heat treatment combined with calcium treatment have been attributed to heat-activated pectin methylesterase and/or to increased calcium diffusion into tissues at higher temperatures. The results derived from this study will help in designing new processes which can be applied in table olive industry.
Keywords: Shelf-life; Green table olives; Post-fermentation treatments; Food colour; Brine; Phenols; Firmness

Mariola Korycinska, Karolina Czelna, Anna Jaromin, Arkadiusz Kozubek, Antioxidant activity of rye bran alkylresorcinols and extracts from whole-grain cereal products, Food Chemistry, Volume 116, Issue 4, 15 October 2009, Pages 1013-1018, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.03.056.
(http://www.sciencedirect.com/science/article/B6T6R-4VWB1DY-9/2/61699f98e6d9b983a5a47bc612062c1a)
Abstract:
The antioxidant properties of rye bran alkylresorcinols (C15:0-C25:0) and extracts from whole-grain cereal products were evaluated using their radical-scavenging activity on DPPH and the chemiluminescence method (CL). DPPH radical reduction varied from ~10% to ~60% for the alkylresorcinol homologues at concentrations from 5 to 300 [mu]M and was not dependent on the length of the alkyl side chain of the particular homologue. Differences in the EC50 values for the

studied compounds were not statistically significant, the values varying from 157 [mu]M for homologue C23:0 to 195 [mu]M for homologue C15:0. Moreover, values of EC50 for all the alkylresorcinol homologues were significantly higher than those for Trolox and [alpha]-, [delta]-, and [gamma]-tocopherols, compounds with well-defined antioxidant activity and used as positive controls. CL inhibition was evaluated for all the tested alkylresorcinol homologues at concentrations of 5 and 10 [mu]M and varied from ~27% to ~77%. Similar to the DPPH method, the slight differences in CL inhibition suggest that the length of the alkyl side chain had no major impact on their antioxidant properties. The extracts from whole-grain products were added to the DPPH and CL reaction systems and their antioxidant activities were tested and compared with the total amount of alkylresorcinols evaluated in the extracts. DPPH radical and CL reduction for the whole-grain products varied from ~7% to ~43% and from ~37% to ~91%, respectively. A clear relationship between DPPH radical and CL reduction levels and the amount of total alkylresorcinols was obtained for whole-grain breakfast cereals, in which the reduction level decreased in the order rye > wheat > mixed > barley. Therefore it may be considered that the antioxidant activity of alkylresorcinols could be of potential importance to the food industry, which is continuously searching for natural antioxidants for the protection of food products during their processing and storage.
Keywords: Alkylresorcinols; Whole-grain products; Antioxidant activity; DPPH; Luminol

Jose A. Guerrero-Beltran, Yokiushirdhilgilmara Estrada-Giron, Barry G. Swanson, Gustavo V. Barbosa-Canovas, Pressure and temperature combination for inactivation of soymilk trypsin inhibitors, Food Chemistry, Volume 116, Issue 3, 1 October 2009, Pages 676-679, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.03.001.
(http://www.sciencedirect.com/science/article/B6T6R-4VT0X8V-4/2/be2491b68dc3a66331a0d7e9298946b7)
Abstract:
High hydrostatic pressure (HHP) processing, an emerging technology for food preservation, in combination with thermal treatment (250/50, 550/19, 550/65, and 550/80 MPa/[degree sign]C) was applied to soymilk made from previously soaked soybeans (in distilled water or 0.5% sodium bicarbonate solution). First order kinetics constants ranging from 0.081 to 0.217 min-1, for residual trypsin, were estimated in soymilk from soaked soybeans at selected pressure-temperature combinations. Residual trypsin, at 550 MPa and 80 [degree sign]C, was high at higher HHP holding times. The highest percentage of residual trypsin (76%) was estimated after a 15 min holding time. The use of sodium bicarbonate for soaking of soybeans synergistically decreased the trypsin inhibitor activity in soymilk in comparison with residual trypsin using distilled water alone.
Keywords: High pressure; Soymilk; Protease inhibitors; Trypsin

Zhihua Tao, Minoru Sato, Naoki Abe, Toshiyasu Yamaguchi, Toshiki Nakano, Simple and rapid detection of histamine-forming bacteria by differential agar medium, Food Control, Volume 20, Issue 10, October 2009, Pages 903-906, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.12.014.
(http://www.sciencedirect.com/science/article/B6T6S-4V99T6G-1/2/94d6c1e212da1718e7a57fa95156eb12)
Abstract:
The simple and rapid detection of histamine-forming bacteria (HFB) was achieved using a newly developed filtration method. In this method not only liquid samples including seawater, but also seafood, can be assayed on-site. Liquid samples were filtered through a two-layer filtration system with an upper 10-[mu]m pore size membrane filter ([phi] 25 mm) and lower 0.2-[mu]m pore size, spherical membrane filter ([phi] 25 mm). In the case of seafood, samples were minced with nine volumes (v/w) of sterilized saline solution in aseptic conditions, and the homogenates and their dilutions were filtered through the two-layer system. The two-layer membrane filter was then rinsed with 10 ml sterilized saline solution. The lower membrane filter was placed on an artificial seawater

agar medium plate (pH 5.8), containing histidine (0.5%) as a carbon source and bromothymol blue (0.04%) as a pH indicator, and incubated at 35 [degree sign]C. HFB were detected as blue halo colonies on the lower membrane filter after 5 h of incubation. The color change in agar medium is attributed to the alkaline shift following histamine formation by HFB. Histamine-producing ability for colonies with a blue halo was confirmed by prolonged incubation in histidine broth medium at 35 [degree sign]C for 24 h. This simple filtration method can rapidly detect HFB and can be applied to food hygiene systems, including the hazard analysis and control critical point (HACCP) system in seafood processing lines.
Keywords: Histamine-forming bacteria; Microscope; Membrane filter; Detection; Agar medium; HACCP

Feng Wang, Jian Zhang, Weisong Mu, Zetian Fu, Xiaoshuan Zhang, Consumers' perception toward quality and safety of fishery products, Beijing, China, Food Control, Volume 20, Issue 10, October 2009, Pages 918-922, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.01.008.
(http://www.sciencedirect.com/science/article/B6T6S-4VHSDDF-1/2/d94ba81499a89fb8cf56397e5097e5fc)
Abstract:
Consumers around the world increased consumption of fish and fish products in recent years due to recognition of their nutritional value. Frequent occurrences of food safety scares heightened public awareness causing significant reduction in the consumption of the affected products. Many countries, including China, implemented a traceability system to increase vertical coordination and guarantee safety in fish products. This paper aims to provide information on consumers' awareness to quality and safety of fish products, purchasing behavior, and willingness to pay (WTP) for safe fish products in Beijing, China, based on a survey of consumers. The results show a shortage of safety knowledge among customers concerning fish products, including processing, storage, and the traceability system. The age of consumers, educational level, the perception safety and the average price, are the main determinants of Beijing consumer's WTP for the traceable products. On average, consumers are willing to pay a 6% premium for safe, traceable fish products over the price of non-traced products of uncertain safety.
Keywords: Quality and safety; Fish products; Consumer; Willingness to pay; China

F.L. Tchuenbou-Magaia, I.T. Norton, P.W. Cox, Hydrophobins stabilised air-filled emulsions for the food industry, Food Hydrocolloids, Volume 23, Issue 7, October 2009, Pages 1877-1885, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2009.03.005.
(http://www.sciencedirect.com/science/article/B6VP9-4VXB908-2/2/59dd6407886c0fdcc5de2291b6730013)
Abstract:
Hydrophobin HFBII has been extracted from a culture of Trichoderma reesei. The protein has been used to construct air cells of approximately 1-100 [mu]m in size, with approximately 40% of the air cells falling within the 1-2 [mu]m range. We have termed these suspensions air-filled emulsions and propose their use for fat replacement in emulsion based food structures. The air cells in the air-filled emulsion have a surface elasticity, given by the hydrophobin film that helps prevent disproportionation and ripening. The air-filled emulsions show little if any change in individual air cell size when stored for up to 4 months at room temperature. Moreover the interface to the air cells is robust and capable of surviving long, high shear processing steps. Production of the hydrophobin film is an extremely rapid event and ordinarily it is difficult to control during emulsion formation. Here we have used a sonication process to produce the air cells. This process then allows us to control the hydrophobin assembly kinetics in order to ensure that they are not removed from the interface after aggregation, and thus rendered inactive. Using the air-filled emulsions we have created a, so called, tri-phasic system with up to 60% included phase of air and oil in an aqueous continuum and showing a greater than 50% reduction in lipid content when

compared to a rheologically similar oil water emulsion. The tri-phasic emulsions are stable for up to 45 days in terms of droplet size and with no loss of air phase.
Keywords: Hydrophobin; Air-filled emulsion; Tri-phasic emulsion; Interface

Stefan Bojnec, Imre Ferto, Agro-food trade competitiveness of Central European and Balkan countries, Food Policy, Volume 34, Issue 5, October 2009, Pages 417-425, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2009.01.003.
(http://www.sciencedirect.com/science/article/B6VCB-4W034CM-1/2/7d5e9521229dea7423426d719ef65b66)
Abstract:
This paper investigates the level, composition, and differences in agro-food relative trade advantages/disadvantages for eight Central European and Balkan countries on the European Union (EU) markets and their implications for food policy. Higher and more stable relative trade advantages are found for bulk primary raw agricultural commodities and less for consumer-ready foods, implying competitiveness shortcomings in food processing and in international food marketing. Duration analysis shows that the EU enlargement has a negative impact on agro-food relative trade advantages for all eight analyzed countries. Estimations imply that the duration of agro-food relative trade advantages are the highest for Hungary and Poland, and for Bulgaria in differentiated products, indicating their agro-food trade potentials in the EU-15 markets.
Keywords: Relative trade advantages; Agro-food; Central Europe; Balkans; European Union

Anita L. Sikes, Aarti B. Tobin, Ron K. Tume, Use of high pressure to reduce cook loss and improve texture of low-salt beef sausage batters, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 405-412, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.02.007.
(http://www.sciencedirect.com/science/article/B6W6D-4VT0X5H-1/2/8350c199e15a8f9e4635a3aecfa76b69)
Abstract:
Methods were investigated to reduce the salt content of beef-containing smallgoods as high-salt intake has been identified as a public health risk for most individuals. Raw meat batters were manufactured from retail beef mince (4-7% fat) using various NaCl concentrations (0-2%), and were packed into casings and subjected to high pressure processing (up to 400 MPa for 2 min at 10 [degree sign]C). Following pressure treatment, samples were cooked to an internal temperature of 72 [degree sign]C and cooled. Cooked products were assessed for cooking loss, colour and physical consistency by texture profile analysis. Flavour and overall acceptability were assessed by sensory panels. High pressure processing (HPP) was found to produce a dramatic improvement in the moisture retention of the cooked products. Control (unpressurised) sausages containing 2% NaCl had a similar cook loss (9.3%) to pressure-treated sausages containing just 1% NaCl, whereas unpressurised samples with 1% NaCl had a cook loss of 24.9%. The hardness and gumminess of pressure-treated samples was higher compared to untreated samples, at all salt concentrations. The greatest differences in texture with pressure treatment were seen in the 1% NaCl samples. Pressure treatment generally caused no changes in the colour of either the raw or cooked product; however there was a slight increase in 'whiteness' with pressure treatment. Sensory panels reported a greater acceptability in both appearance and texture of pressure-treated sausages of lower salt content compared with non-pressure-treated samples. Examination of extracted proteins using SDS-PAGE and of muscle proteins by thermal analysis indicated that pressure contributed to enhanced binding through protein solubilisation and gelation through partial protein unfolding. The application of high pressure to beef sausages with low-salt content resulted in reduced cooking losses and improved texture.Industrial relevance
Enhanced meat binding through extraction of salt-soluble proteins is an essential step in the formulation of meat products such as sausages and emulsion-type products. The ability to reduce

salt and achieve high binding and water retention through use of HPP is important in being able to produce healthier foods.
Keywords: High pressure; Meat; Muscle proteins; Low salt; Colour; DSC

Ximenita I. Trejo Araya, Nicholas Smale, Dimitrios Zabaras, Emma Winley, Ciaran Forde, Cynthia M. Stewart, A. John Mawson, Sensory perception and quality attributes of high pressure processed carrots in comparison to raw, sous-vide and cooked carrots, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 420-433, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.04.002.
(http://www.sciencedirect.com/science/article/B6W6D-4W1BV85-1/2/966955442799de316784744d0ad33f46)
Abstract:
The application of high pressure processing (HPP) has shown its potential to reduce quality losses of many fruit and vegetable products in comparison to other traditional technologies such as cooking. To identify further opportunities of the application of high pressures in vegetable pieces, the sensory perception and correlation to quality parameters were investigated on carrot sticks (used as model product) submitted to high pressure treatments (600 MPa, 2 min) and compared to other traditional treatments such as sous-vide (90 [degree sign]C, 5 min), cooked (100 [degree sign]C, 20 min) and unprocessed (raw). The results indicated that HPP carrots were not different from sous-vide carrots in many parameters such as: sweetness, green flavour and crunchy texture. Furthermore, high pressure carrots showed significantly higher intensity perception of orange colour and fibrousnesses to the rest of the treatments, while similar brightness to cooked carrots and green odour to raw.
Throughout 14 days of storage at 4 [degree sign]C, there was clear evidence that HPP samples could be preserved better in comparison to the rest of the treatments by not presenting any production of acetic acid (used as quality deterioration reference).
Overall, sensory evaluation showed correlations to many quality measurements in this study, indicating similarities in hardness versus crunchiness perception and juiciness versus moisture perception between HPP and sous-vide samples. GC/MS and GC/MS-O results were also in agreement in most cases when identifying carrot volatile changes between the different treatments and the identification of the development of new compounds formed.
Finally, the tissue structure observed by using Cryo-SEM microscopy, supported the similarities (between HPP and sous-vide) and differences (between treatments) of the quality parameters analysed in this research.Industrial Relevance
Previous reports on HPP for food applications indicated that this technology will only be commercially successful if added value is achieved or if the product characteristic can be retained at a higher level as compared to thermally/traditionally processed foods. This work provides information on textural and chemical (volatile) changes as well as the sensorial perception of carrots which have undergone high pressure processing, as well as how those changes compare to the quality of both raw and thermally processed carrots. These results may be generally applicable to what could be expected to happen to other `hard' tissue vegetable products produced by high pressure processing, over a refrigerated storage time of 14 days.
Keywords: High pressure processing; Sous-vide; Cooked carrots; Sensory perception; Quality

Roman Buckow, Ulrike Weiss, Dietrich Knorr, Inactivation kinetics of apple polyphenol oxidase in different pressure-temperature domains, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 441-448, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.05.005.
(http://www.sciencedirect.com/science/article/B6W6D-4W9XDWT-1/2/14a5d78e815640f4c95edd9b7c0ea55a)
Abstract:

The impact of high hydrostatic pressure and temperature on the stability of polyphenol oxidase (PPO) was studied in cloudy apple juice. Application of 200-500 MPa near room temperature or heat treatment at 45-55 [degree sign]C at ambient pressure caused an increase of PPO activity of up to 65% in freshly squeezed apple juice. Combined pressure-temperature inactivation experiments with fully activated PPO (5 min treatment at 400 MPa and 20 [degree sign]C) were carried out in the range of 0.1-700 MPa and 20-80 [degree sign]C. Enzyme inactivation kinetics followed a 2.2 order reaction scheme at all pressure-temperature conditions tested. A polynomial model was successfully applied to describe the rate of PPO inactivation as a function of pressure and temperature and was used to construct a pressure-temperature isokinetic diagram. This diagram clearly showed synergistic effects of pressure and temperature on the inactivation of apple PPO at pressures above 300 MPa and antagonistic effects at lower pressures. Compared to ambient pressure conditions, temperatures required to inactivate PPO in apple juice were increased 10-15 [degree sign]C at 100-300 MPa.Industrial relevance
High pressure processing of fresh fruits is gaining popularity in the food industry because of its ability to inactivate microorganisms and some enzymes near room temperature with little impact on flavour or nutritional attributes of the food. However, quantitative data regarding the impact of process parameters on the target reaction are required to economically utilise this technology. This paper provides a mathematical model describing the combined effect of pressure, temperature and treatment time on the inactivation of PPO in cloudy apple juice.
Keywords: Polyphenol oxidase; Apple; High pressure; Inactivation; Kinetics

Fernando Sampedro, David J. Geveke, Xuetong Fan, Howard Q. Zhang, Effect of PEF, HHP and thermal treatment on PME inactivation and volatile compounds concentration of an orange juice-milk based beverage, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 463-469, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.05.006.
(http://www.sciencedirect.com/science/article/B6W6D-4W9XG87-1/2/dbaacedcfa874a191c59e4b02e6e8c08)
Abstract:
The effects of thermal, pulsed electric field (PEF) and high hydrostatic pressure (HHP) processing on pectin methyl esterase (PME) activity and volatile compounds concentration in an orange juice-milk beverage were studied. Thermal treatment (85 [degree sign]C, 1 min), PEF treatment (25 kV/cm, 65 [degree sign]C) or HHP treatment (650 MPa, 50 [degree sign]C) were needed to inactivate 90% of PME. Twelve volatile compounds were extracted by solid-phase microextraction (SPME) and selected for quantification by GC-MS following the application of the different treatments. The average loss in concentration of volatile compounds was between 16.0 and 43.0% after thermal treatment. After PEF treatment the average loss was between - 13.7 and 8.3% at 25 [degree sign]C, 5.8 and 21.0% at 45 [degree sign]C and 11.6 and 30.5% at 65 [degree sign]C. After HHP treatment the average loss was between - 14.2 and 7.5% at 30 [degree sign]C and 22.9 and 42.3% at 50 [degree sign]C. The results showed the potential of the nonthermal technologies in providing food with a higher standard of quality compared to thermal processing.Industrial relevance
The use of nonthermal technologies as an alternative to heat processing in the pasteurisation of beverages has acquired relevance in the last years. In this manuscript, we have shown that PEF treatment could achieve a high degree of PME inactivation in an orange juice based beverage, while better preserving the natural aroma than HHP and thermal treatments. PEF processing has an enormous potential to pasteurise fruit juice and preserve its natural quality characteristics.
Keywords: PEF; HHP; Orange juice; Milk; Pectin methyl esterase; Volatile compounds

L.E. Garcia-Amezquita, A.R. Primo-Mora, G.V. Barbosa-Canovas, D.R. Sepulveda, Effect of nonthermal technologies on the native size distribution of fat globules in bovine cheese-making

milk, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 491-494, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.03.002.
(http://www.sciencedirect.com/science/article/B6W6D-4VV2NM1-2/2/6605b5377414cef8e584d713a4852f48)
Abstract:
Milk-fat globule membranes are susceptible to damage by mechanical and thermal processes. This damage is translated into alterations of milk fat structure and functionality of cheese-making milk. The objective of this work was to evaluate the effect of pulsed electrical fields (PEF), high hydrostatic pressure (HHP), and conventional thermal treatments on fat globule size distribution and [zeta]-potential. Milk was processed by HHP at 400 and 500 MPa for 0-20 min, and with PEF at 36 kV/cm and 42 kV/cm up to 64 pulses. The [zeta]-potential of HHP and PEF treated milk were - 15.47 mV and - 14.63 mV respectively. HHP treatments induced fat globules flocculation, increasing their mass moment mean diameter. Although PEF processing did not modify the true mean diameter of MFG, it induced small globules to clump together, causing an apparent increment in the population of larger milk-fat globules.Industrial relevance
The market for traditional raw dairy products has increased in recent times in several regions of the world due to their unique flavor and texture attributes. However, the potential negative implications of consuming raw products limit the growth of this market segment. Manufacture of raw-like cheese from thermally pasteurized milk is not feasible, among other things, because of milk fat globule membrane damage caused by elevated temperatures. Nonthermal food preservation technologies offer the potential to produce milk technically suitable for the industrial manufacture of microbiologically safe raw-like dairy products.
Keywords: Nonthermal technologies; Fat globule; Milk fat globule membrane; PEF; HHP

Lien Lemmens, Evelina Tiback, Cecilia Svelander, Chantal Smout, Lilia Ahrne, Maud Langton, Marie Alminger, Ann Van Loey, Marc Hendrickx, Thermal pretreatments of carrot pieces using different heating techniques: Effect on quality related aspects, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 522-529, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.05.004.
(http://www.sciencedirect.com/science/article/B6W6D-4W91PW2-1/2/20dc33219dc0bf6073e08eb877f4447a)
Abstract:
During fruit and vegetable processing, different thermal processes (blanching, pasteurization, sterilization) based on different heating techniques can be used. In this context, it is important to evaluate the impact of blanching on quality related parameters.
This paper describes a case study on carrot pieces, studying the effect of thermal pretreatments (high temperature blanching, low temperature blanching and low temperature blanching in combination with Ca2+-soaking) on enzyme activity (peroxidase (POD), pectinmethylesterase (PME)), structural properties (degree of methoxylation (DM), texture) and nutritional aspects ([beta]-carotene content). The thermal pretreatments were carried out by conventional heating as well as by microwave heating and ohmic heating, since these new heating methods can become important new technologies in food industry.
It has been shown that, depending on the application, selecting the right pretreatment conditions can help to control the enzyme activity. To obtain a firm carrot texture after thermal processing, low temperature blanching seems to be the most appropriate pretreatment condition. This was supported by the micrographs and the analysis of the degree of methoxylation. Furthermore almost no influence of the pretreatments on the [beta]-carotene content of the samples could be noticed. For all quality parameters studied, no unambiguous effect of the heating technique could be detected. Thus, the time/temperature conditions of the thermal pretreatments determine the quality related aspects, independent of the heating technique used.Industrial relevance

With regard to consumer acceptance, a good quality control of fruit and vegetables is important. Food quality covers a wide range of parameters, including enzyme content, structural properties, nutritional properties, sensorial characteristics etc. This study gives an overview of the effect of blanching, which is a common preprocessing step in food processing, on quality related parameters in carrots. The data deliver integrated information on structural level as well as on nutritional level and on enzyme content. Moreover, novel thermal process technologies (microwave heating, ohmic heating), which gain more and more attention in food industry, are being considered as alternatives for conventional blanching.
Keywords: Carrot; Thermal pretreatments; Quality related enzymes; Structure; [beta]-carotene; Microwave heating; Ohmic heating; Conventional heating

K. Knoerzer, M. Regier, E.H. Hardy, H.P. Schuchmann, H. Schubert, Simultaneous microwave heating and three-dimensional MRI temperature mapping, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 537-544, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.05.013.
(http://www.sciencedirect.com/science/article/B6W6D-4WGDR41-1/2/3068cc00a809b04efb09d0b4cc0bb7a4)
Abstract:
In microwave processing a number of microwave specific factors cause non-uniform heating patterns with hot and cold spots. Hence, the quality and safety of food products can be compromised. Capabilities for creating three-dimensional temperature maps are therefore essential for control, optimisation and validation of microwave heating processes. This paper will discuss the advantages and shortcomings of different techniques for measuring temperatures in electromagnetic fields. The unique possibilities of applying non-invasive magnetic resonance imaging (MRI) for temperature mapping are demonstrated by experiments. In particular, in-situ measurements with three-dimensional isotropic resolution of 1 mm and a reasonable temporal resolution of 13 s are presented and compared with infrared thermography and fibre optic thermometry. Numerical simulations are employed to assess the extent of two kinds of systematic errors involved in the MRI experiment.Industrial relevance
The presented approach for measuring temperatures volumetrically in-situ during a microwave heating process allows for the determination of three-dimensional temperature distributions; hence hot and cold spots in the products can be detected.
Although the experiments in this study have been conducted in a high-resolution MRI tomograph with a small sample diameter, the same approach works in larger scale medical tomographs with bores up to 1 m diameter, making it also relevant for industrial scale applications.
The costs of an MRI tomograph are still high; however, having premium products where quality would be adversely affected by overheating and safety compromised by under-processing, the application of such technology would be of great benefit for the food industry. Two approaches for applying this technology in industrial applications are possible:
1. In-situ temperature measurement would allow for a feed-back control of the process, which is essential for microwave applications to be applied to processing of high quality products.
2. The technology can be used for random tests, which in turn allows for evaluating temperature performance (level and uniformity), as well as fine-tuning of coupled electromagnetics/CFD models to simulate and optimise processing lines.
No calibration of such system is needed and only a small amount of unbound water has to be present in the product for the methodology to be applied on or close to an industrial processing line.
With a feed-back controlled microwave process, which can be simulations or real processes, the main advantage of such applications, the increase of process rates due to the volumetric heating can be utilised and at the same time the quality of the treated product can be optimised and

product safety can be ensured by improving temperature uniformity. Furthermore, regulatory bodies can be satisfied.
Keywords: Microwaves; MRI; Magnetic resonance imaging; Temperature mapping; 3D; Volumetric heating

Ruben P. Jolie, Thomas Duvetter, Ken Houben, Elke Clynen, Daniel N. Sila, Ann M. Van Loey, Marc E. Hendrickx, Carrot pectin methylesterase and its inhibitor from kiwi fruit: Study of activity, stability and inhibition, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 601-609, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.02.003.
(http://www.sciencedirect.com/science/article/B6W6D-4VP4TMH-1/2/ec95a867eb0eb47361f941c6b88764a5)
Abstract:
Carrot pectin methylesterase (PME) and its inhibitor (PMEI) from kiwi fruit were successfully purified by affinity chromatography. Enzyme and inhibitor activity and stability and PME-PMEI complex formation, as influenced by intrinsic product factors (pH and NaCl) and extrinsic process factors (temperature and pressure), were studied. The effect of temperature- or pressure-induced denaturation of PME and PMEI on their respective activities was assessed by estimating inactivation kinetic parameters. PME inactivation obeyed first-order kinetics. The enzyme was rather heat-labile but pressure-stable. PMEI inactivation was best described by a model taking into account a processing-stable PMEI intermediate. The behavior of PME and the PME-PMEI complex at elevated temperature or pressure in the presence of pectin was explored by following methanol formation as a function of treatment time. PME catalytic activity was stimulated up to a certain temperature or pressure level before declining. No conclusive evidence was obtained for a temperature-induced dissociation of the PME-PMEI complex, whereas high pressure exposure caused the complex to separate.Industrial relevance
PME activity control is a major point of interest in the quest of obtaining high quality plant-derived food products. The current study demonstrates that both traditional thermal processing and novel high hydrostatic pressure processing allow stimulation as well as inactivation of PME and, hence, directing the PME-catalyzed pectin hydrolysis. An alternative or additional approach to control endogenous PME activity (e.g. to obtain cloud-stable juices) is through enzyme inhibition using kiwi PMEI. In this context, pH and NaCl boundaries for application were established, the existence of a temperature- and pressure-stable PMEI intermediate was shown and the PME-PMEI complex was proven not to be dissociated at mild temperature and pressure levels. These observations endorse the possibility of inhibiting undesirable PME activity remaining after mild processing.
Keywords: Pectin methylesterase (PME); Pectin methylesterase inhibitor (PMEI); Catalytic activity; Enzyme stability; Inhibition; Thermal and high pressure processing

Li-hua Zhang, Huai-de Xu, Shun-feng Li, Effects of micronization on properties of Chaenomeles sinensis (Thouin) Koehne fruit powder, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 633-637, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.05.010.
(http://www.sciencedirect.com/science/article/B6W6D-4WGK6PJ-1/2/552b35364e842d962212ad47ada58008)
Abstract:
Chaenomeles sinensis (Thouin) Koehne fruits were traditionally used for food and medicinal materials. With the aim of providing necessary reference about the micro-powder as ingredients in food and medicine, this study investigated the physicochemical properties and antioxidation of three C. sinensis (Thouin) Koehne fruit micro-powders, prepared by pulverizing its coarse fruit powder with planetary ball mill for different periods of time. The results demonstrated that planetary ball mill could effectively pulverize coarse powder to different micro-sizes. As milling time increased, the median diameter was significantly decreased and particle size distribution width

narrowed, the angle of repose and swelling capacity improved to a different extent, oil holding capacity of micro-powder was not affected, the water holding capacity, total flavonoid content, DPPH and NO2- radical-scavenging capacity and reducing power were decreased. The results suggested that micronize processing could improve some properties of C. sinensis (Thouin) Koehne fruit powder.Industrial relevance
The plant Chaenomeles sinensis (Thouin) Koehne is known locally as 'Guang Pi Mu Gua', one of the Chinese traditional food and drug fruits, has a golden color and with full-bodied fragrance, and is enriched in dietary fibre, organic acid and some biologically active pentacyclic triterpene acids such as oleanolic acid and ursolic acid. Moreover, its yield was very large, e.g. the total yield has over 100,000 tons in 2006 just in Baihe County, Shaanxi, China. So it is very significant to study its processing. Recently, there has also been a rapid development in micron technology applications along with nanotechnology to develop products that explore novel properties in food and drug industries. Physical and functional properties of some Chinese traditional medicines were found to change with particle size during superfine grinding. So, we begin this research.
Keywords: Chaenomeles sinensis (Thouin) Koehne; Micronization; Particle size; Physicochemical properties; Antioxidation

K. Mehauden, P.W. Cox, S. Bakalis, P.J. Fryer, X. Fan, D.J. Parker, M.J.H. Simmons, The flow of liquid foods in an agitated vessel using PEPT: Implications for the use of TTI to assess thermal treatment, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 643-654, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.06.004.
(http://www.sciencedirect.com/science/article/B6W6D-4WMDHMB-1/2/906103963ab60a5dfc2e81fc64080c7c)
Abstract:
The motion of Time Temperature Integrators (TTI) has been assessed within a scale model vessel designed for thermal processing of viscous complex food fluids using Positron Emission Particle Tracking (PEPT). The vessel, based on the `Vesuvio' vessel made by Giusti Ltd, was filled with water and starch solutions of varying rheology and the effect of rotational speed and fill height was assessed. PEPT was used to measure both the motion of the fluid and the TTI separately, since for the TTI to give a reliable measure of the thermal processing it should be isokinetic and follow the fluid streamlines. For low viscosity fluids, significant settling of the particle relative to the fluid was observed. This did not occur for the more viscous starch solutions where the TTI and fluid behaved similarly regardless of the mixing quality, which was significantly affected by changing fill height and rotational speed. Sub-circulatory regions observed close to the impeller could lead to overprocessing of the food fluids based on TTI measurements in these regions, since they would be expected to be in the coldest part of the vessel. This study shows that TTI can be applied to the processing of viscous fluids within agitated thermal processes, provided that requisite knowledge of the fluid motion and likelihood of settling of the TTI is assessed in tandem.Industrial relevance
Time Temperature Integrators (TTI) are potentially very valuable tools for the measurement and validation of thermal processes. In this paper, conditions under which TTI would be expected to give valid thermal measurements in agitated batch vessels are assessed by measurement of their relative flow to the fluid using a novel visualisation technique. As well as ensuring the correct implementation of TTI, this work could be used to improve vessel design.
Keywords: Time-temperature integrator; Positron emission particle tracking; Thermal processing; Food safety

J.M. Fuentes-Alventosa, S. Jaramillo-Carmona, G. Rodriguez-Gutierrez, R. Rodriguez-Arcos, J. Fernandez-Bolanos, R. Guillen-Bejarano, J.A. Espejo-Calvo, A. Jimenez-Araujo, Effect of the extraction method on phytochemical composition and antioxidant activity of high dietary fibre powders obtained from asparagus by-products, Food Chemistry, Volume 116, Issue 2, 15 September 2009, Pages 484-490, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.02.074.

(http://www.sciencedirect.com/science/article/B6T6R-4VS40CM-4/2/ea21ba990d931807aacab32ea8d9eadb)
Abstract:
Asparagus (Asparagus officinalis L.) spears are highly appreciated for their composition of bioactive compounds. The method by which their by-products are treated affects the phytochemical composition and antioxidant activity of the fibre-rich powders. Factors such as the treatment intensity, the solvent used, and the drying system were studied. Among the asparagus phytochemicals, hydroxycinnamic acids (HCA), saponins, flavonoids, sterols, and fructans were quantified. HCA varied from 2.31 and 4.91 mg/g of fibre, the content being affected by the drying system and, in some cases, the solvent. Fibres from intense treatments had significantly higher amounts of saponin than samples isolated by gentle treatments. Saponin content ranged from 2.14 to 3.64 mg/g of fibre. Flavonoids were the most affected by processing conditions, being present (0.6-1.8 mg/g of fibre) only in three of the samples analysed. Continuous stirring during processing could be the main reason for this result. Sterols and fructans were present in minor amounts, 0.63-1.03 mg/g of fibre and 0.2-1.4 mg/g of fibre, respectively. Soluble and total antioxidant activities were also measured. Fibres with the highest activities corresponded to those with the highest levels of flavonoids and HCA.
Keywords: Asparagus by-product; Dietary fibre; Phytochemicals; Bioactive compounds; Flavonoids; Saponins; Ferulic acid; Fructooligosaccharides; Phytosterols; Antioxidant activity; Fibre-enriched foods

Saleh M.S. Sawalha, David Arraez-Roman, Antonio Segura-Carretero, Alberto Fernandez-Gutierrez, Quantification of main phenolic compounds in sweet and bitter orange peel using CE-MS/MS, Food Chemistry, Volume 116, Issue 2, 15 September 2009, Pages 567-574, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.03.003.
(http://www.sciencedirect.com/science/article/B6T6R-4VT0X8V-2/2/a328d5386579ab89cb7ff1865588d96c)
Abstract:
The food and agricultural products processing industries generate substantial quantities of phenolics-rich subproducts, which could be valuable natural sources of polyphenols. In oranges, the peel represents roughly 30% of the fruit mass and the highest concentrations of flavonoids in citrus fruit occur in peel. In this work we have carried out the characterisation and quantification of citrus flavonoids in methanolic extracts of bitter and sweet orange peels using CE-ESI-IT-MS. Naringin (m/z 579.2) and neohesperidin (m/z 609.2) are the major polyphenols in bitter orange peels and narirutin (m/z 579.2) and hesperidin (m/z 609.2) in sweet orange peels. The proposed method allowed the unmistakable identification, using MS/MS experiments, and also the quantification of naringin (5.1 +/- 0.4 mg/g), neohesperidin (7.9 +/- 0.8 mg/g), narirutin (26.9 +/- 2.1 mg/g) and hesperidin (35.2 +/- 3.6 mg/g) in bitter and sweet orange peels. CE coupled to MS detection can provides structure-selective information about the analytes. In this work we have developed a CE-ESI-IT-MS method for the analysis and quantification of main phenolic compounds in orange peels.
Keywords: Phenolic compounds; Orange peel; Capillary electrophoresis; Electrospray ionisation-mass spectrometry detection

Adam R. Reddon, Peter L. Hurd, Sex differences in the cerebral lateralization of a cichlid fish when detouring to view emotionally conditioned stimuli, Behavioural Processes, Volume 82, Issue 1, September 2009, Pages 25-29, ISSN 0376-6357, DOI: 10.1016/j.beproc.2009.03.005.
(http://www.sciencedirect.com/science/article/B6T2J-4VXDTW8-1/2/0fdbabe95a1faffeb6c2c6af83e6f289)
Abstract:

The lateralization of emotion has been described in a variety of animals. The right hemisphere has been implicated in the processing of negative emotions while positive emotions are processed in the left. Most animal studies of this phenomenon to date have used intrinsically emotionally arousing stimuli and there are few examples of lateralized responses to learned emotional triggers. It is known that males and females may demonstrate different patterns of lateralization, and that these sex differences may interact with other variables. We investigated the lateralized response of male and female convict cichlids to emotionally conditioned stimuli. One stimulus was given an appetitive (positive emotional valence) association by pairing with food. The other stimulus was given an aversive (negative emotional valence) association by pairing with a chemical alarm signal. We found that males tend to be more strongly lateralized to aversive stimuli while females are more strongly lateralized when responding to appetitive stimuli.
Keywords: Archocentrus nigrofasciatus; Cerebral lateralization; Convict cichlids; Damage-induced alarm signals; Emotional conditioning; Sex differences

G.I. Katsaros, P. Katapodis, P.S. Taoukis, Modeling the effect of temperature and high hydrostatic pressure on the proteolytic activity of kiwi fruit juice, Journal of Food Engineering, Volume 94, Issue 1, September 2009, Pages 40-45, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.02.026.
(http://www.sciencedirect.com/science/article/B6T8J-4VT5TFJ-3/2/f3373135616d53acab69ee16757d929b)
Abstract:
Actinidin is the sulfhydryl protease of kiwi fruit. It can have applications in the food industry replacing other plant sulfhydryl proteases like papain and ficin, as milk clotting enzyme for traditional and novel dairy products, as meat tenderizer and beer clarifier. High hydrostatic pressure (HHP) will allow the controlled inactivation of actinidin after it has been applied and caused the desirable extent of clotting or tenderization, respectively. Thermal inactivation and inactivation by HHP (200-800 MPa) combined with moderate temperature (25-50 [degree sign]C) of the endogenous actinidin in kiwi fruit juice was studied. The enzyme activity was measured spectrophotometrically based on the hydrolysis of a chromophore-peptide compound. Actinidin inactivation followed first order kinetics at the studied processing conditions. The activation energy Ea, and the activation volume Va were expressed as a function of pressure and temperature, respectively. The enzyme inactivation was modeled by a single multi-parameter equation in the studied temperature and pressure domain. The developed kinetics allow the selection of optimal HHP process conditions for achieving the desirable enzyme activity control after the targeted proteolysis has been achieved in products where the kiwi fruit actinidin has been applied.
Keywords: Actinidin; Proteolytic activity; High pressure; Enzyme kinetics; Thermal inactivation

M. Armenteros, M. Heinonen, V. Ollilainen, F. Toldra, M. Estevez, Analysis of protein carbonyls in meat products by using the DNPH-method, fluorescence spectroscopy and liquid chromatography-electrospray ionisation-mass spectrometry (LC-ESI-MS), Meat Science, Volume 83, Issue 1, September 2009, Pages 104-112, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2009.04.007.
(http://www.sciencedirect.com/science/article/B6T9G-4W26GFN-4/2/b9e1d34fd9404b98283c1218d90cb629)
Abstract:
Liquid chromatography-electrospray ionisation-mass spectrometry (LC-ESI-MS) was applied as an advanced methodology to study the suitability of using [alpha]-aminoadipic semialdehyde (AAS) and [gamma]-glutamic semialdehyde (GGS) as protein oxidation markers in meat products. The results obtained were compared to those obtained by using the DNPH-method and fluorescence spectroscopy for the analysis of protein carbonyls. Lipid oxidation was also investigated in order to elucidate the relationship between lipid and protein oxidation measurements. Both semialdehydes were originally detected in a food system which proves that lysine, arginine and proline are degraded as a result of oxidative reactions to yield AAS and GGS in meat products. A lack of

consistency was observed between the MS results for AAS and GGS and the values obtained by the DNPH-method and the fluorescence spectroscopy. Unlike the last two methods, AAS and GGS measurements have proved to be unaffected by the composition or the structure of the food matrix providing precise information about the fate of particular amino acids during processing of muscle foods. These semialdehydes, and particularly GGS, could be used as indicators of protein oxidation in meat products like TBARS numbers are commonly used as lipid oxidation markers. In fact, a significant correlation was found between GGS values and TBARS highlighting the timely interaction between lipid and protein oxidation.
Keywords: Protein oxidation; DNPH; Spectrofluorometry; LC-ESI-MS; [alpha]-Aminoadipic semialdehyde; [gamma]-Glutamic semialdehyde; Meat products

Shige Koseki, Microbial Responses Viewer (MRV): A new ComBase-derived database of microbial responses to food environments, International Journal of Food Microbiology, Volume 134, Issues 1-2, Food Micro 2008 'Evolving Microbial Food Safety and Quality' 1-4 September 2008, Aberdeen, Scotland, UK, 31 August 2009, Pages 75-82, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.12.019.
(http://www.sciencedirect.com/science/article/B6T7K-4V761X6-1/2/d7c89b4b31a34bbd24246f723f4eb569)
Abstract:
ComBase is a large database of microbial responses to food environments and has attracted the attention of many researchers and food processors. Although ComBase contains a vast amount of data, it is not easy to obtain desired information from the retrieved data. In the present study, we developed a new ComBase-derived database (Microbial Responses Viewer, MRV) consisting of microbial growth/no growth data. The response was defined as representing 'growth' if a significant increase in bacterial concentration (> 1.0 log10) was observed. Alternatively, 'growth' was defined as a positive value of the specific growth rate. The growth/no growth data of nineteen different microorganisms were extracted from all the data in ComBase comprising 29 kinds of microorganism. Furthermore, the specific growth rate of each microorganism was modelled as a function of temperature, pH, and water activity (aw) using a Poisson log-linear model, which is a family of generalized linear models (GLMs). For 16 of the 19 microorganisms, the specific growth/death rate was successfully modelled as a function of temperature, pH, and aw using GLM. The specific growth rate was illustrated using a two-dimensional contour plot with growth/no growth data. MRV provides information concerning growth/no growth boundary conditions and the specific growth rates of queried microorganisms. Using MRV, food processors can easily find the appropriate food design and processing conditions. This database will contribute to the efficient and safe production and distribution of processed foods.
Keywords: ComBase; Predictive microbiology; Growth/no growth interface model; Growth rate; Generalized linear model (GLM)

N.C. Elviss, C.L. Little, L. Hucklesby, S. Sagoo, S. Surman-Lee, E. de Pinna, E.J. Threlfall and on behalf of the Food Water and Environmental Surveillance Network, Microbiological study of fresh herbs from retail premises uncovers an international outbreak of salmonellosis, International Journal of Food Microbiology, Volume 134, Issues 1-2, Food Micro 2008 'Evolving Microbial Food Safety and Quality' 1-4 September 2008, Aberdeen, Scotland, UK, 31 August 2009, Pages 83-88, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.01.015.
(http://www.sciencedirect.com/science/article/B6T7K-4VFK7PY-2/2/ec2917e432438338e118b0189b8f33a6)
Abstract:
This Local Authorities Co-ordinators of Regulatory Services/Health Protection Agency study was prompted by the increasing concern regarding the microbiological safety of ready-to-eat salad vegetable products, particularly fresh herbs. During May to October 2007, 3760 ready-to-eat fresh

herbs, of different varieties, were sampled across the UK to assess their microbiological safety in relation to salmonella contamination and levels of Escherichia coli. Sixty (1.6%) herb samples were found to be of unsatisfactory quality according to Regulation (EC) No. 2073/2005 on the microbiological criteria of foodstuffs, i.e. contaminated with Salmonella spp. and/or containing E. coli at > 103 cfu/g. When criteria in the PHLS Microbiological Guidelines for some ready-to-eat foods (2000) were used, 117 (3.9%) of herb samples were of unsatisfactory quality due to the presence of salmonella and/or E. coli at >= 102 cfu/g. Eighteen (0.5%) samples of six different herb types were contaminated with Salmonella spp.: identified as serotypes Senftenberg (8), Agona (2), Anatum (1), Durban (1), Javiana (1), Mgulani (1), Montevideo (1), Unnamed (I 16:g, t: z42) (1), Virchow (1) and mixed Newport & Virchow (1). In each case the retailer and the UK Food Standards Agency were immediately informed and remedial action taken. Samples contaminated with S. Senftenberg were specifically associated with basil grown in Israel. Thirty-two human cases of S. Senftenberg infection were subsequently identified throughout England and Wales and a further 19 in Scotland, Denmark, The Netherlands and the USA. The strain of S. Senftenberg identified from the basil and that from cases had an indistinguishable molecular profile, suggesting a likely connection between consumption of basil and human infection. The presence of Salmonella spp. is unacceptable in ready-to-foods such as fresh herbs. This study highlights the necessity of applying good agricultural and hygiene practices pre-, during and post-harvest, at processing, retail and use. These practices help to prevent cross-contamination and/or bacterial growth occurring in these products. Best practice is to store and display such products at, or below, 8 [degree sign]C as this inhibits bacterial growth.
Keywords: Fresh herbs; Contamination; Salmonellosis; Salmonella; Escherichia coli

Alexandros Tiganitas, Nikoleta Zeaki, Antonia S. Gounadaki, Eleftherios H. Drosinos, Panagiotis N. Skandamis, Study of the effect of lethal and sublethal pH and aw stresses on the inactivation or growth of Listeria monocytogenes and Salmonella Typhimurium, International Journal of Food Microbiology, Volume 134, Issues 1-2, Food Micro 2008 'Evolving Microbial Food Safety and Quality' 1-4 September 2008, Aberdeen, Scotland, UK, 31 August 2009, Pages 104-112, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.02.016.
(http://www.sciencedirect.com/science/article/B6T7K-4VPD6H8-3/2/29b02caad7f7f1f6ad9c6ec810f79dea)
Abstract:
During food processing, microorganisms are commonly exposed to multiple sublethal or lethal stresses (commonly aw, pH) sequentially or simultaneously. The objectives of the present study were: (i) to comparatively evaluate the survival of Listeria monocytogenes and Salmonella Typhimurium in lethal acid (pH 4.0 and 4.5 with lactic acid) or osmotic conditions (15 and 20% NaCl), applied singly, sequentially (pH then NaCl or NaCl then pH), or simultaneously at 5 and 10 [degree sign]C; and, (ii) to quantify the effect of osmotic shifts at pH 7.0, 6.0 or 5.0 (adjusted with lactic acid) on the lag phase and growth rate of L. monocytogenes at 10 [degree sign]C. In sequential lethal stress applications, the second stress was applied 2 or 3 days after the first for Salmonella and L. monocytogenes, respectively. Acid tolerance of L. monocytogenes was higher than osmotic tolerance and the opposite was observed for Salmonella. Higher inactivation was observed after exposure to pH 4.0 compared to pH 4.5 as well as after exposure to 20% NaCl compared to 15% NaCl. Exposure to stresses sequentially resulted in faster ($P < 0.05$) reductions than the exposure to single or double stresses applied simultaneously. The pH then NaCl sequence was more detrimental for pathogens than the reverse sequence. Incubation temperature (5 and 10 [degree sign]C) did not show any profound ($P < 0.05$) effect on microbial inactivation. When L. monocytogenes was incubated at aw 0.930 or 0.995 at 30 [degree sign]C, then the lag phase increased both in subsequent osmotic downshift and upshift, respectively, at 10 [degree sign]C. Shorter lag phase and higher ability to initiate growth at lower aw was observed after pre-adaptation at pH 6.0 or 5.0 compared to neutral pH. The results may contribute to the review of

critical limits in low pH (with lactic acid) and water activity products, considering the risk of L. monocytogenes and Salmonella survival. In addition, the present indications may address the points in processing where stricter sanitation procedures should be applied in order to minimize the risk of survivors.
Keywords: Stress; Acid; Osmotic; Listeria monocytogenes; Sequence; Salmonella

L. Jacxsens, J. Kussaga, P.A. Luning, M. Van der Spiegel, F. Devlieghere, M. Uyttendaele, A Microbial Assessment Scheme to measure microbial performance of Food Safety Management Systems, International Journal of Food Microbiology, Volume 134, Issues 1-2, Food Micro 2008 'Evolving Microbial Food Safety and Quality' 1-4 September 2008, Aberdeen, Scotland, UK, 31 August 2009, Pages 113-125, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.02.018.
(http://www.sciencedirect.com/science/article/B6T7K-4VR241W-2/2/befb0a774cddca47d74d66737632a0c5)
Abstract:
A Food Safety Management System (FSMS) implemented in a food processing industry is based on Good Hygienic Practices (GHP), Hazard Analysis Critical Control Point (HACCP) principles and should address both food safety control and assurance activities in order to guarantee food safety. One of the most emerging challenges is to assess the performance of a present FSMS. The objective of this work is to explain the development of a Microbial Assessment Scheme (MAS) as a tool for a systematic analysis of microbial counts in order to assess the current microbial performance of an implemented FSMS. It is assumed that low numbers of microorganisms and small variations in microbial counts indicate an effective FSMS. The MAS is a procedure that defines the identification of critical sampling locations, the selection of microbiological parameters, the assessment of sampling frequency, the selection of sampling method and method of analysis, and finally data processing and interpretation. Based on the MAS assessment, microbial safety level profiles can be derived, indicating which microorganisms and to what extent they contribute to food safety for a specific food processing company. The MAS concept is illustrated with a case study in the pork processing industry, where ready-to-eat meat products are produced (cured, cooked ham and cured, dried bacon).
Keywords: Food Safety Management System; Microbiological food safety; Performance tool

Lartey G. Lawson, Jorgen D. Jensen, Pia Christiansen, Mogens Lund, Cost-effectiveness of Salmonella reduction in Danish abattoirs, International Journal of Food Microbiology, Volume 134, Issues 1-2, Food Micro 2008 'Evolving Microbial Food Safety and Quality' 1-4 September 2008, Aberdeen, Scotland, UK, 31 August 2009, Pages 126-132, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.03.024.
(http://www.sciencedirect.com/science/article/B6T7K-4W0R0GJ-3/2/465cb7036da8068104d6188058619531)
Keywords: Food safety; Salmonella; Yersinia; Pig slaughterhouses; Abattoir decontamination; Cost-effectiveness

Di Wang, HongNian Wu, XueTing Hu, MingLiang Yang, Ping Yao, ChenJiang Ying, LiPing Hao, LieGang Liu, Application of Hazard Analysis Critical Control Points (HACCP) system to Vacuum-packed Sauced Pork in Chinese Food Corporations, Food Control, In Press, Accepted Manuscript, Available online 29 August 2009, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.08.009.
(http://www.sciencedirect.com/science/article/B6T6S-4X3W44W-2/2/d1d895b38aeeeab078098353fccf8e98)
Abstract:
Our study aims to establish an HACCP system which was implemented for the quality assurance of vacuum-packed sauced pork processing in Chinese food corporations. After identified hazards, the critical control points were defined using a decision tree. In addition, the vacuum-packed

sauced pork products, manufactured by 3 corporations, were detected for chemical and microbial contaminants before and after the implementation of the HACCP system, respectively. According to the national food hygiene standards accepted by P.R. China, for nitrite, aerobic plate count and coliforms, the percentage of products obtained before vs after the implementation of HACCP satisfying the standards was 86.2% vs 100%, 71.3% vs 96.4% and 71.3% vs 95.5%, respectively. In conclusion, the contaminants of vacuum-packed sauced pork can be reduced or eliminated if an HACCP system is applied effectively.
Keywords: HACCP; vacuum-packed sauced pork; chemical and microbiological contaminants

Jennifer Davis, Ulf Sonesson, Daniel U. Baumgartner, Thomas Nemecek, Environmental impact of four meals with different protein sources: Case studies in Spain and Sweden, Food Research International, In Press, Accepted Manuscript, Available online 29 August 2009, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.08.017.
(http://www.sciencedirect.com/science/article/B6T6V-4X3W44N-3/2/1117137d4e69bbd53242ea5138a7b988)
Abstract:
The production of food protein has a considerable impact on the environment. This paper investigates the potential environmental benefits of introducing more grain legumes in human nutrition. Four meals with different amounts of soybeans or peas (either used as feed for production of pork or directly consumed) were analysed using life cycle assessment methodology. The results of this analysis demonstrate that it is environmentally favourable to replace meat with peas. In particular, the addition of more legumes to human nutrition potentially aids in the reduction of global warming, eutrophication, acidification, and land use; however, in terms of energy use, a completely vegetarian pea burger meal requires the same amount of energy as other meat-containing meals. Feeding pigs with European-produced peas instead of imported soybeans, in addition to partial replacement (10%) of meat protein with pea protein, failed to reduce the environmental impact of the meal In summary, peas can be considered `green', but there remains a significant need for more energy-efficient processing of vegetarian products.
Keywords: meals, environmental impact, LCA, protein

Jan Hubert, Marta Nesvorna, Vaclav Stejskal, The efficacy of sieving, filth flotation and Tullgren heat extraction for detecting various developmental stages of Tribolium castaneum and Ephestia kuehniella in samples of wheat grain, flour and semolina, Journal of Stored Products Research, In Press, Corrected Proof, Available online 29 August 2009, ISSN 0022-474X, DOI: 10.1016/j.jspr.2009.05.003.
(http://www.sciencedirect.com/science/article/B6T8Y-4X3VM07-1/2/22332b71154c8cc5f8c5ea1b3ba67e59)
Abstract:
A prerequisite for effective pest risk management in food is the unbiased interpretation of results obtained by various detection methods. In this study we compared the sensitivity of filth flotation tests, sieving and heat extraction in Tullgren-Berlese funnels for detecting insect contaminants. Samples of wheat grain, flour and semolina were contaminated with eggs, juveniles and adults of Tribolium castaneum, and eggs or larvae of Ephestia kuehniella. Calibration methods were applied for every detection method, and total and sample recoveries and detection limits were calculated for each method, food substrate and contaminant type. The tested contaminants were not detected on a qualitative level by any single technique, instead a combination of techniques was necessary for detection. Sieving was the method with the highest total recoveries, ranging from 90 to 100%. Filth flotation was a uniquely effective for egg detection, with total recoveries ranging from 65 to 95%. The extraction of adults and larvae of both species in Tullgren-Berlese funnels failed in semolina and flour, and was of very limited success in grain. The detection limits for sieving were from 1 to 16 contaminants/kg commodity. The detection limits for filth flotation were

from 224 to 508 eggs, and 58 to 507 adults or larvae/kg commodity. The sample recoveries were usually influenced by sample size, species, stadium and their interactions, and indicated how to optimize method protocols. The calibration of methods provided estimates of contaminant densities different from those obtained without calibration. Our work revealed that some currently used methods are not sensitive enough to detect all stages of insect pests, or in some cases, low levels of pest infestation. This lack of sensitivity potentially enables the infested cereal food product to continue down the food processing chain even after laboratory inspection.
Keywords: Stored-product insects; Storage; Detection; Filth flotation; Sieving; Tullgren-Berlese funnels

V.P. Valdramidis, P.J. Cullen, Brijesh K. Tiwari, Colm P. O'Donnell, Quantitative modelling approaches for ascorbic acid degradation and non-enzymatic browning of orange juice during ultrasound processing, Journal of Food Engineering, In Press, Accepted Manuscript, Available online 28 August 2009, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.08.025.
(http://www.sciencedirect.com/science/article/B6T8J-4X3N3W0-4/2/6dc261bb53546c98ab9dffcde8abe76b)
Abstract:
The objective of this study was to develop a deterministic modelling approach for non-enzymatic browning (NEB) and ascorbic acid (AA) degradation in orange juice during ultrasound processing. Freshly squeezed orange juice was sonicated using a 1,500 W ultrasonic processor at a constant frequency of 20 kHz and processing variables of amplitude level (24.4 - 61.0 [mu]m), temperature (5 - 30 oC) and time (0 - 10 min). The rate constants of the NEB and AA were estimated by a primary model (zero and first order) while their relationship with respect to the processing factors was tested for a number of models, i.e., second order polynomial, different types of Ratkowsky-type model, and an Arrhenius-type model. The non-monotonic behaviour of NEB has been described more accurately by the use of a polynomial model. The rate constants of AA were described by a similar type of model having a monotonic behaviour. A synergistic effect of temperature for different amplitudes on the rate constant of both NEB and AA was observed, while an antagonistic effect of amplitude on the rate of NEB was evident. The models with the best fit were integrated to produce contour plots for the combined amplitude and temperature. The constructed contour plots illustrate that low temperatures and intermediate amplitudes, i.e., 42.7 [mu]m, result in lower NEB and AA deterioration and consequently better quality orange juice. The overall developed modeling approaches exploit quality data in order to identify the optimal processing regions for eliminating quality deterioration of orange juice during ultrasound processing which is of high importance to the food industry.
Keywords: Ultrasound; Ascorbic acid; non-enzymatic browning; modelling

Jonathan F. Holmes, Wiley D. Holcombe, Guidelines for Designing Washdown Robots for Meat Packaging Applications, Trends in Food Science & Technology, In Press, Accepted Manuscript, Available online 19 August 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.08.003.
(http://www.sciencedirect.com/science/article/B6VHY-4X1SB8B-1/2/d4ff5eba41c9daafd65d9ac108fa4436)
Abstract:
Robots are prominent in several industries where high volumes of products are produced and handled; however, certain food processing industries have been slow to adopt robotic work cells due to the high cost of existing systems, difficulties in handling fresh meat products, and inability for robots to survive a corrosive washdown environment. In this paper, we describe the development of a robot specifically designed to address all of these needs with special attention on testing and validation of that machine. The end result of this is the beginning of a design guideline to assist those involved in the design and operation of washdown robots for the food processing industry.

Mohebbat Mohebbi, Mohammad-R Akbarzadeh-T, Fakhri Shahidi, Mahmoud Moussavi, Hamid-B Ghoddusi, Computer vision systems (CVS) for moisture content estimation in dehydrated shrimp, Computers and Electronics in Agriculture, In Press, Corrected Proof, Available online 15 August 2009, ISSN 0168-1699, DOI: 10.1016/j.compag.2009.07.005.
(http://www.sciencedirect.com/science/article/B6T5M-4X0W4GX-1/2/e9f2a0a1dd0da885961c4396f4822ffa)
Abstract:
This paper presents a method based on computer vision systems (CVS) to estimate shrimp dehydration level by analyzing color during drying process. Since the most commonly used color space in food industry is L*a*b, transformation of RGB digital images to L*a*b units was carried out using direct two steps model with [gamma] factor. Experimental data obtained from images captured at different drying temperatures (100-130 [degree sign]C) and several time intervals (15-180 min) were analyzed with a complete randomized block design (CRBD), and the means were compared with Duncan's multi-range test. Multiple linear regression (MLR) and artificial neural networks (ANN) were applied for correlating the color features to moisture content of dried shrimp determined chemically. Results obtained with these two models lead to 0.80 and 0.86 correlation coefficients in MLR and ANN models, respectively. While there is no statistical difference at $p < 0.05$ between the two modeling approaches, both approaches indicate successful prediction of shrimp dehydration with high correlation to those found by the more expensive and intrusive chemical method. The automated vision based system, therefore, has the advantage over conventional subjective methods and instrumental ones for being objective, fast, non-invasive, inexpensive and precise.
Keywords: Dehydrated shrimp; Image processing; RGB; L*a*b; Moisture content

Hainer Wackerbarth, Uwe Kuhlmann, Filip Tintchev, Volker Heinz, Peter Hildebrandt, Structural changes of myoglobin in pressure-treated pork meat probed by resonance Raman spectroscopy, Food Chemistry, Volume 115, Issue 4, 15 August 2009, Pages 1194-1198, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.01.027.
(http://www.sciencedirect.com/science/article/B6T6R-4VDS8M7-B/2/77f687465614fe082394d0ecd62a94ed)
Abstract:
Pork meat was pressurised at 600-700 MPa under conditions applicable for non-thermal food preservation and studied by resonance Raman spectroscopy with 413-nm excitation to probe selectively myoglobin, which is the origin of the red colour of meat. The spectra of intact, non-pressurised meat tissue exclusively display the resonance Raman bands of the ferrous deoxy-form of myoglobin whereas upon pressure treatment a new six-coordinated low spin ferrous species is formed (>60%), that is assigned to a bis-histidine complex including the distal histidine 64. This structural change is associated with a shift of the electronic transitions of the haeme and thus affects the colour of the meat. In contrast, solutions containing myoglobin extracted from pressurised and non-pressurised pork meat give rise to resonance Raman spectra characteristic of the ferrous oxy-form of myoglobin, evidently due to the accessibility of the proteins for oxygen in solution. Upon pressure treatment of the extracted myoglobin solution, the oxy-form is partially converted to the met-(like) ferric form implying a pressure-induced oxidation of the haeme. Thus, this structural transition does not only cause a colour change but also may initiate unwanted oxidative side reactions involving further components of meat. Evidently, such effects can be largely avoided when the oxy- to deoxy-myoglobin ratio is kept small prior to pressure treatment.
Keywords: Meat; Myglobin; Raman spectroscopy; High pressure; Food processing

Guillermo Nino-Medina, Elizabeth Carvajal-Millan, Jaime Lizardi, Agustin Rascon-Chu, Jorge A. Marquez-Escalante, Alfonso Gardea, Ana L. Martinez-Lopez, Victor Guerrero, Maize processing

waste water arabinoxylans: Gelling capability and cross-linking content, Food Chemistry, Volume 115, Issue 4, 15 August 2009, Pages 1286-1290, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.01.046.
(http://www.sciencedirect.com/science/article/B6T6R-4VFK82H-H/2/61d667faeb564db3cf748abb5a365ca4)
Abstract:
Water-soluble feruloylated arabinoxylans were extracted from maize processing waste water (nejayote) generated from tortilla-making industries. Nejayote arabinoxylans (NAX) presented a ferulic acid content of 0.23 [mu]g/mg, an arabinose to xylose ratio (A/X) of 0.65, an intrinsic viscosity, [[eta]], of 183 ml/g and a molecular weight (Mw) of 60 kDa. Laccase-induced gels were obtained from 4% (w/v) NAX solution while, at lower concentrations, no gelation was observed. Laccase covalent cross-linking of NAX led to the formation of diferulic (di-FA) and triferulic (tri-FA) acid structures. 4% (w/v) NAX gel presented di-FA and tri-FA contents of 0.02 and 0.01 [mu]g/mg NAX, respectively, and a G' value of 2 Pa. Recuperation of this gum from a low-value maize by-product could represent a commercial advantage over other gums commonly used in the food industry.
Keywords: Arabinoxylan; Nejayote; Maize; Ferulic acid; Gels

Lisbeth A. Pacheco-Palencia, Susanne U. Mertens-Talcott, Stephen T. Talcott, In vitro Absorption and Antiproliferative Activities of Monomeric and Polymeric Anthocyanin Fractions from Acai Fruit (Euterpe oleracea Mart.), Food Chemistry, In Press, Accepted Manuscript, Available online 14 August 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.08.017.
(http://www.sciencedirect.com/science/article/B6T6R-4X0PC51-2/2/a287b14b7e0d142e98ff7fa203efbc96)
Abstract:
Anthocyanins are among the most important and widely consumed natural pigments in foods, and have attracted increased attention as natural food colourants and potent bioactive agents. However, anthocyanins are generally unstable and may undergo chemical changes that include oxidative and polymerization reactions during processing and storage. The role of anthocyanin polymerization reactions on in vitro intestinal absorption and anti-cancer properties has not been assessed. This study investigated the chemical composition, antioxidant properties, antiproliferative activity, and in-vitro absorption of monomeric and polymeric anthocyanin fractions from acai fruit (Euterpe oleracea Mart.). Cyanidin-3-rutinoside (58.5 +/- 4.6%) and cyanidin-3-glucoside (41.5 +/- 1.1%) were the predominant compounds found in monomeric fractions, while a mixture of anthocyanin adducts were found in polymeric fractions and characterized using HPLC-ESI-MSn analyses. Monomeric fractions (0.5-100 [mu]g cyanidin-3-glucoside equivalents/ml) inhibited HT-29 colon cancer cell proliferation by up to 95.2% while polymeric anthocyanin fractions (0.5-100 [mu]g cyanidin-3-glucoside equivalents/ml) induced up to 92.3% inhibition. In vitro absorption trials using Caco-2 intestinal cell monolayers demonstrated that cyanidin-3-glucoside and cyanidin-3-rutinoside were similarly transported from the apical to the basolateral side of the cell monolayers (0.5-4.9% efficiency), while no polymeric anthocyanins were transported following incubation for up to 2 hours. The addition of polymeric anthocyanin fractions also decreased monomeric anthocyanin transport by up to 40.3 +/- 2.8%. Results from this study provide novel information regarding the relative size, absorption, and bioactive properties of anthocyanin monomers and polymer adducts.
Keywords: Anthocyanin, polymerization, in-vitro absorption, cancer proliferation, acai

Kuanglin Chao, Chun-Chieh Yang, Moon S. Kim, Spectral line-scan imaging system for high-speed nondestructive wholesomeness inspection of broilers, Trends in Food Science & Technology, In Press, Accepted Manuscript, Available online 14 August 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.08.001.

(http://www.sciencedirect.com/science/article/B6VHY-4X0PBYV-1/2/2f283cb69ea0067c7e0311aaeadd5c30)
Abstract:
A spectral line-scan imaging system was developed for automated online wholesomeness inspection of broilers and evaluated in a commercial chicken processing plant. Real-time online hyperspectral images acquired by the system on a 140 bird-per-minute processing line were analyzed to optimize Region of Interest (ROI) size and location and to determine key wavebands by which to implement online high-speed multispectral inspection. Multispectral imaging algorithms were implemented to automatically recognize individual carcasses entering and exiting the field of view, to locate the ROI on the bird, and to determine the condition for each carcass as being wholesome or unwholesome. The high accuracy obtained from the in-plant evaluation results showed that the system can effectively perform food safety inspection tasks on high-speed processing lines. The system is being adapted for commercial use in pre-sorting chicken during initial processing operations, to help poultry processors improve production efficiency and satisfy increasing consumer demand for poultry products.
Keywords: Food Safety; Poultry; Spectral Imaging; Wholesomeness Inspection

M.A. Ayadi, I. Makni, H. Attia, Thermal diffusivities and influence of cooking time on textural, microbiological and sensory characteristics of turkey meat prepared products, Food and Bioproducts Processing, In Press, Corrected Proof, Available online 13 August 2009, ISSN 0960-3085, DOI: 10.1016/j.fbp.2009.03.002.
(http://www.sciencedirect.com/science/article/B8JGD-4X0F6VM-1/2/2cff3eea9e2c694a5798e782a5311063)
Abstract:
Cooking represents an important step in food processing for both sensorial and safety aspects. The aim of this study is to determine (i) the thermal diffusivity and (ii) the impact of cooking time on sensorial and microbiological characteristics of sausages (locally called salami) and ham products prepared from turkey meat. The water immersion method is used for cooking and cooling. Time-temperature profiles and thermal diffusivity values show that heat penetration in ham is slower than heat penetration in salami products. Three cooking times were applied to each material, and cooking time variation had a significant ($p < 0.05$) effect on the textural parameters of both salami and ham samples. Sensorial tests also showed significant differences ($p < 0.05$) between products cooked for different times, whereas all three gave acceptable hygienic parameters.
Keywords: Turkey meat products; Cooking; Cooling; Thermal diffusivity; Texture; Microbiology

Polly E. Boon, Jiri Ruprich, Annette Petersen, Shahnaz Moussavian, Francesca Debegnach, Jacob D. van Klaveren, Harmonisation of food consumption data format for dietary exposure assessments of chemicals analysed in raw agricultural commodities, Food and Chemical Toxicology, In Press, Uncorrected Proof, Available online 12 August 2009, ISSN 0278-6915, DOI: 10.1016/j.fct.2009.08.003.
(http://www.sciencedirect.com/science/article/B6T6P-4X087KN-1/2/607073a590c665e652b1435e81cb2c7c)
Abstract:
In this paper, we present an approach to format national food consumption data at raw agricultural commodity (RAC) level. In this way, the data is both formatted in a harmonised way given the comparability of RACs between countries, and suitable to assess the dietary exposure to chemicals analysed in RACs at a European level. In this approach, consumption data needs to be converted to edible part of RAC (e-RAC) level using a RAC conversion database. To subsequently use this data in exposure assessments, both e-RACs and RACs analysed in chemical control programmes should be classified via a uniform system. Furthermore, chemical concentrations in RACs may need to be converted to e-RAC level using processing factors. To illustrate the use of

this approach, we describe how the Dutch RAC conversion database was used to convert consumption data of four national consumption surveys to e-RAC level, and the use of the FAO/WHO Codex Classification system of Foods and Animal Feeds to harmonise the classification. We demonstrate that this approach works well for pesticides and glycoalkaloids, and is an essential step forward in the harmonisation of risk assessment procedures within Europe when addressing chemicals analysed in RACs by all national food control systems.
Keywords: Harmonisation food consumption data format; Exposure modelling; Conversion database

Clara Fares, Cristiano Platani, Antonietta Baiano, Valeria Menga, Effect of processing and cooking on phenolic acid profile and antioxidant capacity of durum wheat pasta enriched with debranning fractions of wheat, Food Chemistry, In Press, Accepted Manuscript, Available online 8 August 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.08.006.
(http://www.sciencedirect.com/science/article/B6T6R-4WYDN4F-2/2/9d47f3eee169122839e5d1054acd6422)
Abstract:
The effect of processing and cooking on phenolic acids profile and antioxidant properties of durum wheat (Triticum turgidum L. var. durum) pasta samples enriched with debranning fractions of an Italian wheat (Triticum aestivum L.) cultivar were studied.
Trolox equivalent antioxidant capacity by free radical scavenging activity against ABTS*+ cation radical, phenolic acid profile, total phenolic content and fibre were determined. In the first debranning fractions of wheat, the highest concentration of phenolic acids, namely ferulic acid, and antioxidant capacity was found, but a diminishing trend was observed as the debranning levels proceeded. When semolina was processed into spaghetti, the main effect of processing was a reduction of the free phenolic acids content, chiefly caused by p-hydroxybenzoic acid decrease. In contrast an increase in bound phenolics fraction was observed. The boiling water could have enhanced the extraction of bound phenolics from the food matrix, primarily ferulic acid ester linked to cell walls. Cooking affected also the antioxidant capacity of pasta samples by enhancing its antioxidant properties in vitro.
Keywords: Phenolic Acids; Trolox Equivalent Antioxidant Capacity; Total Phenolic Content; Pasta Processing; Cooking; Fibre; Debranning Fractions

Ilse M.T. Nijs, Ingmar H.A. Franken, Peter Muris, Enhanced processing of food-related pictures in female external eaters, Appetite, In Press, Corrected Proof, Available online 6 August 2009, ISSN 0195-6663, DOI: 10.1016/j.appet.2009.07.022.
(http://www.sciencedirect.com/science/article/B6WB2-4WY13V1-1/2/98c79080f57f7a5b05848a8013d80b81)
Abstract:
The main purpose of the present study was to investigate differences in the processing of food-related pictures between women with high and low scores on a scale of external eating. Electro-encephalographic brain activity was recorded, while participants were actively exposed to pictures of food items and control pictures. The amplitude of the P300 component of the even-related potentials was used as an index of motivation-related information processing. An enlarged P300 wave to food-related pictures was found in high external eaters as compared to low external eaters at several parieto-occipital electrode positions. No group differences in P300 amplitudes were found to neutral control pictures or pleasant, motivationally salient control pictures. It can be concluded that external eaters display an enhanced attentional processing of food-related information. The findings are discussed within an incentive sensitization model of overeating behavior.
Keywords: External eating; Obesity; Event-related potentials; P300; Attentional bias; Food craving

Lewis H. Ziska, G. Brett Runion, Martha Tomecek, Stephen A. Prior, H. Allen Torbet, Richard Sicher, An evaluation of cassava, sweet potato and field corn as potential carbohydrate sources for bioethanol production in Alabama and Maryland, Biomass and Bioenergy, In Press, Corrected Proof, Available online 6 August 2009, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2009.07.014.
(http://www.sciencedirect.com/science/article/B6V22-4WXXV59-1/2/389ce351c88050e213c6bdfbf904aee7)
Abstract:
The recent emphasis on corn production to meet the increasing demand for bioethanol has resulted in trepidation regarding the sustainability of the global food supply. To assess the potential of alternative crops as sources of bioethanol production, we grew sweet potato (Ipomoea batatas) and cassava (Manihot esculentum) at locations near Auburn, Alabama and Beltsville, Maryland in order to measure root carbohydrate (starch, sucrose, glucose) and root biomass. Averaged for both locations, sweet potato yielded the highest concentration of root carbohydrate (ca 80%), primarily in the form of starch (ca 50%) and sucrose (ca 30%); whereas cassava had root carbohydrate concentrations of (ca 55%), almost entirely as starch. For sweet potato, overall carbohydrate production was 9.4 and 12.7 Mg ha-1 for the Alabama and Maryland sites, respectively. For cassava, carbohydrate production in Maryland was poor, yielding only 2.9 Mg ha-1. However, in Alabama, carbohydrate production from cassava averaged ~10 Mg ha-1. Relative to carbohydrate production from corn in each location, sweet potato and cassava yielded approximately 1.5x and 1.6x as much carbohydrate as corn in Alabama; 2.3x and 0.5x for the Maryland site. If economical harvesting and processing techniques could be developed, these data suggest that sweet potato in Maryland, and sweet potato and cassava in Alabama, have greater potential as ethanol sources than existing corn systems, and as such, could be used to replace or offset corn as a source of biofuels.
Keywords: Biofuels; Carbohydrate; Cassava (Manihot esculenta); Corn (Zea mays); Ethanol potential; Sweet potato (Ipomoea batatas); Yield

Ilkin Yucel Sengun, Dennis S. Nielsen, Mehmet Karapinar, Mogens Jakobsen, Identification of lactic acid bacteria isolated from Tarhana, a traditional Turkish fermented food, International Journal of Food Microbiology, In Press, Corrected Proof, Available online 4 August 2009, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.07.033.
(http://www.sciencedirect.com/science/article/B6T7K-4WXHBPG-4/2/8c85c1b73cc526469890bf508d5f1ede)
Abstract:
Tarhana is a traditional fermented product produced from a mixture of spontaneously fermented yogurt and wheat flour in Turkey. The aims of the present study were to enumerate and identify for the first time by molecular biology-based methods predominant lactic acid bacteria (LAB) isolated during processing of Tarhana. Samples were collected from eight different regions of Turkey. In order to explore the relationship between raw material and the microbiology of Tarhana, yogurt and wheat flour were also analyzed. A total of 226 Gram-positive and catalase-negative isolates were obtained from MRS, M17 and SBM (Slanetz and Bartley Medium). The isolates were grouped and identified using a combination of pheno- and genotypic methods including rep-PCR fingerprinting [(GTG)5 primer], multiplex PCR, 16S rRNA gene sequencing and carbohydrate assimilation profiling. Pediococcus acidilactici were found to constitute 27% of the isolates, 19% were identified as Streptococcus thermophilus, 19% as Lactobacillus fermentum, 12% as Enterococcus faecium, 7% as Pediococcus pentosaceus, 5% as Leuconostoc pseudomesenteroides, 4% as Weissella cibaria, 2% as Lactobacillus plantarum, 2% as Lactobacillus delbrueckii spp. bulgaricus, 2% as Leuconostoc citreum, 1% as Lactobacillus paraplantarum and 0.5% as Lactobacillus casei. The different production sites investigated all had individual LAB profiles, but with P. acidilactici and S. thermophilus being isolated from the majority of samples. The main source of P. acidilactici and S. thermophilus was found to be the yogurt.

Keywords: Tarhana; Lactic acid bacteria; S. thermophilus; P. acidilactici; Biodiversity

Les Copeland, Jaroslav Blazek, Hayfa Salman, Mary Chiming Tang, Form and functionality of starch, Food Hydrocolloids, Volume 23, Issue 6, 9th International Hydrocolloids Conference, August 2009, Pages 1527-1534, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2008.09.016.
(http://www.sciencedirect.com/science/article/B6VP9-4TNWH26-1/2/0a73d93127c2303d2eb090acf3fa3f0f)
Abstract:
Starch is a macro-constituent of many foods and its properties and interactions with other constituents, particularly water and lipids, are of interest to the food industry and for human nutrition. Starch varies greatly in form and functionality between and within botanical species, which provides starches of diverse properties but can also cause problems in processing due to inconsistency of raw materials. Being able to predict functionality from knowledge of the structure, and explain how starch interacts with other major food constituents remain significant challenges in food science, nutrition, and for the starch industry generally. This paper describes our current understanding of starch structure that is relevant to its functionality in foods and nutrition. Amylose influences the packing of amylopectin into crystallites and the organization of the crystalline lamellae within granules, which is important for properties related to water uptake. Thermal properties and gel formation appear to be influenced by both amylose content and amylopectin architecture. While amylose content is likely to have an important bearing on the functional properties of starch, subtle structural variations in the molecular architecture of amylopectin introduces uncertainty into the prediction of functional properties from amylose content alone. Our ability to relate starch granule structure to suitability for a particular food manufacturing process or its nutritional qualities depends not only on knowledge of the genetic and environmental factors that control starch biosynthesis, and in turn granule morphology, but also on how the material is processed.
Keywords: Starch; Granules; Amylose; Amylopectin; Functional properties; Starch-lipid complexes; Enzymic digestion

M.A. Murcia, A.M. Jimenez-Monreal, L. Garcia-Diz, M. Carmona, L. Maggi, M. Martinez-Tome, Antioxidant activity of minimally processed (in modified atmospheres), dehydrated and ready-to-eat vegetables, Food and Chemical Toxicology, Volume 47, Issue 8, August 2009, Pages 2103-2110, ISSN 0278-6915, DOI: 10.1016/j.fct.2009.05.039.
(http://www.sciencedirect.com/science/article/B6T6P-4WHMS7Y-1/2/3a3944ca52f8fa057cee399f874fe07b)
Abstract:
The antioxidant activity of vegetables subjected to minimal processing (in MAP, and intended for cooking or for use in salads), dehydrated condiments and ready-to-eat vegetables such as soups and purees, was assessed by reference to their ability to scavenge lipoperoxyl and hydroxyl radicals and Trolox-equivalent antioxidant capacity. In the case, the MAP vegetables the measurements were repeated during eight days of storage in a domestic refrigerator and after cooking (boiling, microwaving, pressure cooking, griddling, frying and baking). MAP vegetables had a good or very good antioxidant capacity, and showed no significant loss of antioxidant activity or scavenging capacity compared with fresh vegetables. The cooking treatments that keep the antioxidant activity of MAP vegetables are microwaving, sauteing and baking. The most aggressive method of cooking were steaming, boiling and frying. The dehydrated condiments (tablets) showed higher antioxidant activity than the ready-to-eat soup. The enrichment of stews and casseroles, with dehydrated vegetable tablets, and the consumption of soup or vegetable purees represent an increased antioxidant intake in our diet. Also 'ready-to-eat' vegetable soups show antioxidant activity after they have been submitted to heat treatment to increase their shelf-life. They can be recommended as alternatives in our non-stop 'life style'.

Keywords: Free radical; Vegetable; Modified atmosphere; Ready-to-eat; Cooking treatment; Dehydrated-soup

C. Baudrit, A. Helias, N. Perrot, Joint treatment of imprecision and variability in food engineering: Application to cheese mass loss during ripening, Journal of Food Engineering, Volume 93, Issue 3, August 2009, Pages 284-292, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.01.031.
(http://www.sciencedirect.com/science/article/B6T8J-4VJBTHM-1/2/712ce0db68b21829f46401bb2d88947a)
Abstract:
Food processes are complex systems because of the complexity of microbiological and/or physicochemical activities and the combinations of these activities are responsible for the physical, chemical, biological and structural changes in food properties. As a result of time limits, financial constraints and scientific and technological obstacles, available knowledge about food processes is often vague, imprecise and incomplete. These considerations, plus the random nature of knowledge, lead to uncertainty that must be taken into account in the decision-making process. It may occur in practice that some model input variables and parameters can be represented by probability distributions (due to observed variability and sufficient statistics), while others are better represented by possibility distributions (due to imprecision), or by the Dempster-Shafer belief functions (due to partial observed variability and partial ignorance). This paper applies recent methods in order to represent and propagate uncertainties relative to the input variables and parameters of a cheese ripening mass loss model in the presence of imprecise and incomplete knowledge. The joint propagation of variability and imprecision through the model combines interval analysis with Monte-Carlo simulations and provides lower and upper probability bounds (referred to as Belief and Plausibility, respectively) of exceeding a certain value of cheese mass during the ripening process.
Keywords: Monte-Carlo simulation; Imprecise probabilities; Fuzzy sets; Food processing; Cheese ripening

, Position of the American Dietetic Association: Food and Water Safety, Journal of the American Dietetic Association, Volume 109, Issue 8, August 2009, Pages 1449-1460, ISSN 0002-8223, DOI: 10.1016/j.jada.2009.06.379.
(http://www.sciencedirect.com/science/article/B758G-4WTSXF9-V/2/af34161db39d5a428ae1b86a1f9e8f35)
Abstract:
It is the position of the American Dietetic Association that the public has the right to a safe food and water supply. The Association supports collaboration among food and nutrition professionals, academics, representatives of the agricultural and food industries, and appropriate government agencies to ensure the safety of the food and water supply by providing education to the public and industry, promoting technological innovation and applications, and supporting further research. New food and water safety issues evolve as the environment changes. Food and nutrition professionals should collaborate with food and agriculture industries and members of the medical community in a joint effort to address these issues. Recent food- and waterborne illnesses have occurred in new settings and/or unique foods not traditionally associated with foodborne illness outbreaks. New issues associated with food safety and security that have emerged support the need for continued education and research. Government programs have developed powerful tools such as FoodNet and PulseNet to detect food- and waterborne illness outbreaks in the United States. These government programs have provided the data to enhance public policy and educational programs such as FightBac! Mandatory and voluntary adoption of Hazard Analysis Critical Control Points in the foodservice and processing industries have contributed to a decrease in foodborne illness outbreaks from traditional foods and some microorganisms usually associated with foodborne illnesses. Food and nutrition professionals are positioned to provide food and water

safety education in community, clinical settings, and foodservice operations and food industries. With an aging population and an increased number of people at risk due to medical conditions for food- and waterborne illness, food and nutrition professionals should be involved in collaborative food and water safety issues in educational, research, and policy agenda settings. As the food and nutrition experts, food and nutrition professionals must assume a major role in food and water safety education and research.

Beilei Ge, Jianghong Meng, Advanced Technologies for Pathogen and Toxin Detection in Foods: Current Applications and Future Directions, Journal of the Association for Laboratory Automation, Volume 14, Issue 4, Automation in Food and Agricultural Laboratories, August 2009, Pages 235-241, ISSN 1535-5535, DOI: 10.1016/j.jala.2008.12.012.
(http://www.sciencedirect.com/science/article/B75DF-4WNXF44-G/2/f4785227d0a70ff2f24ff9042e928e2f)
Abstract:
Despite great strides made in the past decades, the detection of microbial pathogens and their toxins in foods remains a challenging task. This is due primarily to several inherent difficulties associated with food analysis, that is, the complexities of food matrices (inhibitors and normal flora), the attributes of target analytes in foods (low level, heterogeneous distribution, and cell injury during processing), and the ratio between the amount of food samples and the detection assay volume. This review aims to provide an overview and a better understanding of the limitations, current applications, and future perspectives in terms of pathogen and toxin detection in foods.
Keywords: detection; pathogen; toxin; food; advanced technology

Nesrine Marouani-Gadri, Gladys Augier, Brigitte Carpentier, Characterization of bacterial strains isolated from a beef-processing plant following cleaning and disinfection -- Influence of isolated strains on biofilm formation by Sakai and EDL 933 E. coli O157:H7, International Journal of Food Microbiology, Volume 133, Issues 1-2, 31 July 2009, Pages 62-67, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.04.028.
(http://www.sciencedirect.com/science/article/B6T7K-4W7YXN1-1/2/7d9725bcc6b6c2c93ff89e91dad3eac1)
Keywords: E. coli O157:H7; Cleaning and disinfection; Microbial ecology; Dual-organism biofilms

Anet Rezek Jambrak, Zoran Herceg, Drago Subaric, Jurislav Babic, Mladen Brncic, Suzana Rimac Brncic, Tomislav Bosiljkov, Domagoj Cvek, Branko Tripalo, Jurica Gelo, Ultrasound effect on physical properties of corn starch, Carbohydrate Polymers, In Press, Corrected Proof, Available online 30 July 2009, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2009.07.051.
(http://www.sciencedirect.com/science/article/B6TFD-4WWG351-1/2/6730818fef19c681c268ef2c9a071183)
Abstract:
High power ultrasound (HPU) represents a non-thermal processing method that has been rapidly researched and used in the last 10 years. The application of power ultrasound offers the opportunity to modify and improve some technologically important compounds which are often used in food products. One of them is starch. The aim of this research was to examine the effect of the high power ultrasound of 24 kHz frequency on rheological and some physical properties of corn starch. Various ultrasound treatments were used; an ultrasound probe set with different intensities (34, 55, 73 W cm-2) and treatment times (15 and 30 min) and ultrasound bath of 2 W cm-2 intensity and treatment times (15 and 30 min). Rheological parameters, turbidity and swelling power of corn starch suspensions were determined for native and ultrasonically treated corn starch suspensions. Differential scanning calorimetry was used in order to examine the pasting properties of corn starch. The results have shown that the ultrasound treatment of corn starch distorts the

crystalline region in starch granules. The results of differential scanning calorimetry measurements have shown a decrease in enthalpy of gelatinization. A significant decrease in consistency coefficient (k) has also been observed. The consistency coefficient decreases stepwise jointly with the increasing ultrasound power. The increase in the swelling power is associated with water absorption capacity and corn starch granules solubility, respectively.
Keywords: Corn starch; Ultrasound; Rheology; DSC; Microscopy

Elise Chadeau, Nadia Oulahal, Laurent Dubost, Frederic Favergeon, Pascal Degraeve, Anti-Listeria innocua activity of silver functionalised textile prepared with plasma technology, Food Control, In Press, Corrected Proof, Available online 30 July 2009, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.07.013.
(http://www.sciencedirect.com/science/article/B6T6S-4WWG31N-3/2/4f0645e39c06f8243ce2db2de717b0c0)
Abstract:
Thin layers of silver particles (10-100 A) were deposited by plasma technology on textiles mainly composed with cotton or polyester in order to obtain antimicrobial properties. The antimicrobial activity against a Listeria innocua strain (LRGIA 01) of these textiles was assessed following a protocol based on the ISO 20743-2005 standard. The number of cultivable bacteria on textiles was then monitored for 24 h. The microbial population after 24 h at 30 [degree sign]C attained 107 CFU g-1 on control textiles while it did not exceed 103 CFU g-1 on plasma-treated textile. All plasma-treated with silver textiles were anti-Listeria (up to 7 log CFU g-1 decimal reductions of L. innocua populations) and this observation was confirmed by scanning electron microscopy. These textiles could thus have potential applications in food-processing industry to control cross-contaminations by L. monocytogenes.
Keywords: Silver antimicrobial textile; Plasma technology; Listeria innocua

Hosahalli S. Ramaswamy, Yanwen Shao, Songming Zhu, High-pressure destruction kinetics of Clostridium sporogenes ATCC 11437 spores in milk at elevated quasi-isothermal conditions, Journal of Food Engineering, In Press, Corrected Proof, Available online 30 July 2009, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.07.019.
(http://www.sciencedirect.com/science/article/B6T8J-4WWG2X9-1/2/1c1d5d1285763e3f912d1917c1d0a84c)
Abstract:
The high-pressure sterilization establishment requires data on isobaric and isothermal destruction kinetics of baro-resistant pathogenic and spoilage bacterial spores. In this study, Clostridium sporogenes 11437 spores (107 CFU/ml) inoculated in milk were subjected to different pressure, temperature and time (P, T, t) combination treatments (700-900 MPa; 80-100 [degree sign]C; 0-32 min). An insulated chamber was used to enclose the test samples during the treatment for maintaining isobaric and quasi-isothermal processing conditions. Decimal reduction times (D values) and pressure and temperature sensitivity parameters, ZT (pressure constant) and ZP (temperature constant) were evaluated using a 3 x 3 full factorial experimental design. HP treatments generally demonstrated a minor pressure pulse effect (PE) (no holding time) and the pressure hold time effect was well described by the first order model (R2 > 0.90). Higher pressures and higher temperatures resulted in a higher destruction rate and a higher microbial count reduction. At 900 MPa, the temperature corrected D values were 9.1, 3.8, 0.73 min at 80, 90, 100 [degree sign]C, respectively. The thermal treatment at 0.1 MPa resulted in D values 833, 65.8, 26.3, 6.0 min at 80, 90, 95, 100 [degree sign]C respectively. By comparison, HP processing resulted in a strong enhancement of spore destruction at all temperatures. Temperature corrected ZT values were 16.5, 16.9, 18.2 [degree sign]C at 700, 800, 900 MPa, respectively, which were higher than the thermal z value 9.6 [degree sign]C. Hence, the spores had lower temperature sensitivity at elevated pressures. Similarly, corrected ZP values were 714, 588, 1250 MPa at 80,

90, 100 [degree sign]C, respectively, which illustrated lower pressure sensitivity at higher temperatures. By general comparison, it was concluded that within the range operating conditions employed, the spores were relatively more sensitive to temperature than to pressure.
Keywords: High-pressure; Sterilization; Spore inactivation; Clostridium sporogenes; Kinetics; Food safety

Jordi Bonet, Jose Costa, Romain Sire, Jean-Michel Reneaume, Alexandra Elena Plesu, Valentin Plesu, Grigore Bozga, Revalorization of glycerol: Comestible oil from biodiesel synthesis, Food and Bioproducts Processing, In Press, Corrected Proof, Available online 28 July 2009, ISSN 0960-3085, DOI: 10.1016/j.fbp.2009.06.003.
(http://www.sciencedirect.com/science/article/B8JGD-4WW1730-1/2/8e5fc21e373a3a2eb5314d47d671ac71)
Abstract:
High dependence on fossil fuel has caused increase of carbon dioxide concentration in the atmosphere. The actual political trends are towards an increased use of renewable fuels from agricultural origin. One of the main products of the European biorefineries is biodiesel. The main reaction involved in biodiesel synthesis produces a large amount of glycerol as by-product. Two aspects are arising in this respect: the glycerol obtained as residue and the food conversion to fuel. This paper deals with the revalorization of the residual glycerol stream to obtain triacetin (glyceryl triacetate), the lightest comestible oil. The application of glycerol as raw material to produce triacetin is not new. The goal of this paper is to check the feasibility of this transformation in an efficient integrated continuous process which is suitable for processing high quantities of glycerol. A kinetic model was determined experimentally for the production of triacetin from glycerol and acetic acid in the absence of catalyst. The results showed that by process integration of the reaction and distillation in the same unit (reactive distillation), a more sustainable process can be developed. The proposed configuration output is checked by rigorous simulation.
Keywords: Glycerine; Triacetin; Reactive distillation; Process simulation; Biodiesel

Avelino Alvarez-Ordonez, Ana Fernandez, Ana Bernardo, Mercedes Lopez, Acid tolerance in Salmonella typhimurium induced by culturing in the presence of organic acids at different growth temperatures, Food Microbiology, In Press, Corrected Proof, Available online 24 July 2009, ISSN 0740-0020, DOI: 10.1016/j.fm.2009.07.015.
(http://www.sciencedirect.com/science/article/B6WFP-4WV77VJ-1/2/567243d45bb794215415babc772e358f)
Abstract:
The influence of growth temperature and acidification of the culture medium up to pH 4.25 with acetic, citric, lactic and hydrochloric acids on the growth and subsequent acid resistance at pH 3.0 of Salmonella typhimurium CECT 443 was studied. The minimum pH value which allowed for S. typhimurium growth within the temperature range of 25-37 [degree sign]C was 4.5 when the pH was reduced using citric and hydrochloric acids, and 5.4 and 6.4 when lactic acid and acetic acid were used, respectively. At high (45 [degree sign]C) or low (10 [degree sign]C) temperatures, the growth pH boundary was increased about 1 pH unit. The growth temperature markedly modified the acid resistance of the resulting cells. In all cases, D-values were lower for cells grown at 10 [degree sign]C and significantly increased with increasing growth temperature up to 37 [degree sign]C, at which D-values obtained were up to 10 times higher. Cells grown at 45 [degree sign]C showed D-values similar to those found for cells grown at 25 [degree sign]C. The growth of cells in acidified media, regardless of the pH value, caused an increase in their acid resistance at the four incubation temperatures, although the magnitude of the Acid Tolerance Response (ATR) observed depended on the growth temperature. Acid adapted cultures at 10 [degree sign]C showed D-values ranging from 5.75 to 6.91 min, which turned out to be about 2 times higher than those corresponding to non-acid adapted cultures, while higher temperatures induced an increase in D-

values of at least 3.5 times. Another finding was that, while at 10 and 45 [degree sign]C no significant differences among the effect of the different acids tested in inducing an ATR were observed, when cells were grown at 25 and 37 [degree sign]C citric acid generally turned out to be the acid which induced the strongest ATR. Results obtained in this study show that growth temperature is an important factor affecting S. typhimurium acid resistance and could contribute to find new strategies based on intelligent combinations of hurdles, which could prevent the development or survival of Salmonella spp. in foods. The fact that moderately low temperatures (10 [degree sign]C) markedly decrease the acid resistance and increase the growth pH boundary of S. typhimurium suggests the convenience to control the temperature during food processing as a strategy to prevent the growth and survival of this pathogenic microorganism.
Keywords: Salmonella typhimurium; Acid tolerance response; Growth temperature; Acid resistance; Acid adaptation; Food safety

Sonia Arora, Sudesh Jood, N. Khetarpaul, Effect of germination and probiotic fermentation on nutrient composition of barley based food mixtures, Food Chemistry, In Press, Corrected Proof, Available online 23 July 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.07.035.
(http://www.sciencedirect.com/science/article/B6T6R-4WV15W4-2/2/864ed27ddf0101476e5c2457b83aac42)
Abstract:
Food mixtures formulated from non-germinated and germinated barley flour, whey powder and tomato pulp (2:1:1w/w) were autoclaved, cooled and fermented with 5% Lactobacillus acidophilus curd (106 cells/ml) at 37 [degree sign]C for 12 h. The cell count was found significantly higher (8.88 cfu/g) in the fermented food mixture formulated from germinated flour as compared to the non-germinated barley based food mixture. A significant drop in pH with corresponding increase in titratable acidity was found in the germinated barley flour based food mixture. Processing treatments like germination, autoclaving and probiotic fermentation did not bring about any significant change in ash and fat contents, but significant decrease was noticed in crude protein, crude fibre, starch, total and insoluble dietary fibre contents. The combined processing caused significant improvement in reducing sugar, thiamine, niacin, lysine and soluble dietary fibre contents of barley based food mixtures. In conclusion, a combination of germination and fermentation is a potential process for enhancing the nutritional quality of food mixtures based on coarse cereals.
Keywords: Food mixtures; Germination; Lactobacillus acidophilus; pH; Titratable acidity; Proximate composition; Vitamins; Lysine; Available carbohydrates; Dietary fibre

Ankit Patras, Nigel. P. Brunton, Colm O'Donnell, B.K. Tiwari, Effect of thermal processing on anthocyanin stability in foods; mechanisms and kinetics of degradation, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 23 July 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.07.004.
(http://www.sciencedirect.com/science/article/B6VHY-4WV15MX-1/2/7f9f9c25521d77988083ecb852a52aeb)
Abstract:
Anthocyanins are the most abundant flavonoid constituents of fruits and vegetables. The conjugated bonds in their structures, which absorb light at about 500 nm, are the basis for the red, blue and purple colours of fruits, vegetables and their products. Anthocyanin pigments readily degrade during thermal processing which can have a dramatic impact on colour quality and may also affect nutritional properties. This review attempts to summarize some important aspects of anthocyanin degradation during thermal processing. Conclusions regarding the mechanisms and kinetics of anthocyanin degradation during heat treatment are postulated based on current findings.

Jing Wang, Baoguo Sun, Yanping Cao, Yuan Tian, Chengtao Wang, Enzymatic preparation of wheat bran xylooligosaccharides and their stability during pasteurization and autoclave sterilization at low pH, Carbohydrate Polymers, Volume 77, Issue 4, 19 July 2009, Pages 816-821, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2009.03.005.
(http://www.sciencedirect.com/science/article/B6TFD-4VTCM73-B/2/c5a011bc86a4cff598bcfc31ff8bad10)
Abstract:
Xylooligosaccharides (XOS) were prepared from wheat bran insoluble dietary fiber (WBIDF) by treatment with commercial xylanase preparation Sunzymes. XOS, with a purity of 95% (w/w) and degree of polymerization of 2-7 and the ratio of arabinose to xylose of 0.27, was obtained with a yield of approximately 31.2% of WBIDF. Their stability was evaluated by comparing with that of commercial fructooligosaccharides (FOS) during pasteurization (60-100 [degree sign]C, 30 min) and autoclave sterilization (121 [degree sign]C, 1 kg/cm2, 10-50 min) at pH 2.0-4.0. XOS was characterized by a high thermal stability during pasteurization at pH 2.5-4.0 and sterilization at pH 3.0-4.0. Even at pH 2.0, the remaining XOS reached 97.2% (w/w) and 84.2% (w/w) during pasteurization (100 [degree sign]C, 30 min) and sterilization (50 min), respectively. Compared with FOS, XOS was strongly resistant to lower acidic conditions. The results revealed that XOS was considered to be more suitable for use as functional food ingredients.
Keywords: Fructooligosaccharides; Insoluble dietary fiber; Stability; Thermal processing; Xylooligosaccharides

L. Alvarez-Jubete, H. Wijngaard, E.K. Arendt, E. Gallagher, Polyphenol composition and in vitro antioxidant activity of amaranth, quinoa buckwheat and wheat as affected by sprouting and baking, Food Chemistry, In Press, Corrected Proof, Available online 19 July 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.07.032.
(http://www.sciencedirect.com/science/article/B6T6R-4WT3WMB-3/2/d5d0ba1878b1ca0ee481693447fc5a57)
Abstract:
This study examined the polyphenol composition and antioxidant properties of methanolic extracts from amaranth, quinoa, buckwheat and wheat, and evaluated how these properties were affected following two types of processing: sprouting and baking. The total phenol content amongst the seed extracts were significantly higher in buckwheat (323.4 mgGAE/100 g) and decreased in the following order: buckwheat > quinoa > wheat > amaranth. Antioxidant capacity, measured by the radical 2,2-diphenyl-1-picylhydrazyl scavenging capacity and the ferric ion reducing antioxidant power assays was also highest for buckwheat seed extract ($p < 0.01$). Total phenol content and antioxidant activity was generally found to increase with sprouting, and a decrease in levels was observed following breadmaking. Analysis by liquid chromatography coupled with diode array detector revealed the presence of phenolic acids, catechins, flavanol, flavone and flavonol glycosides. Overall, quinoa and buckwheat seeds and sprouts represent potential rich sources of polyphenol compounds for enhancing the nutritive properties of foods such as gluten-free breads.
Keywords: Pseudocereals; Amaranth; Quinoa; Buckwheat; Gluten-free diet; Baking; Sprouts; Antioxidant capacity; Total phenol content; Polyphenol composition

Wen-Hwa Ko, Evaluating food safety perceptions and practices for agricultural food handler, Food Control, In Press, Corrected Proof, Available online 18 July 2009, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.07.005.
(http://www.sciencedirect.com/science/article/B6T6S-4WSY49M-2/2/16c79daedfc9f26a981455ecec0228bd)
Abstract:
This study investigates food safety perceptions and agricultural food handling practices, as well as satisfaction with the work performance of such handlers. Data are collected from 333 food

handlers at agricultural food processing companies or restaurants. Data is analyzed by SPSS, with statistical analyses including descriptive statistics, t tests and regression analyses. Dimensions pertaining to food safety perception and practices include personal sanitation, pre-handling food preparation, food preparation and after food preparation. The scales of food safety perception during analysis are higher than what are typically found in practice, and some gaps are identified. Analysis results indicate that food preparation and after food preparation dimensions have significantly higher mean values than those associated with pre-food handling and personal sanitation. Regression analysis further demonstrates that satisfaction with work performance can accurately predict food safety perception and practice components. Moreover, their handling practices mediate how perception affects satisfaction with work performance of food handlers.
Keywords: Food safety; Perception; Practice; Work performance satisfaction

Juan M. Cevallos-Cevallos, Jose I. Reyes-De-Corcuera, Edgardo Etxeberria, Michelle D. Danyluk, Gary E. Rodrick, Metabolomic analysis in food science. A review, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 18 July 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.07.002.
(http://www.sciencedirect.com/science/article/B6VHY-4WSY4B5-1/2/553839e41a99452fc6e7376995e8aca7)
Abstract:
Metabolomics has emerged as an important tool in many disciplines such as human diseases and nutrition, drug discovery, plant physiology and others. In food science, metabolomics has recently risen as a tool for quality, processing and safety of raw materials and final products. This article discusses the latest advances in food metabolomics from the discriminative, predictive, and informative approaches, as well as the typical methods used at each step of the metabolomic analysis.

Robert Soliva-Fortuny, Ana Balasa, Dietrich Knorr, Olga Martin-Belloso, Effects of pulsed electric fields on bioactive compounds in foods: A review, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 18 July 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.07.003.
(http://www.sciencedirect.com/science/article/B6VHY-4WSY4B5-2/2/b438b24ea024193836b03ff40e100896)
Abstract:
Pulsed electric fields have the potential to be used as alternative to other conventional techniques of food production. In the last few years, several studies have demonstrated the ability of intense treatments to obtain safe and shelf-stable liquid foods. On the other hand, novel applications such as improvement of mass transfer processes or generation of bioactive compounds by using moderate field strengths are under current development. However, the effects of pulsed electric field treatments on minor constituents of foods, namely on bioactive compounds, have not been always considered. This review aims at updating the state of the art regarding the impact of pulsed electric field processing conditions on the stability of bioactive compounds in food systems.

E.P. Black, J. Cascarino, D. Guan, K.E. Kniel, D.T. Hicks, L.F. Pivarnik, D.G. Hoover, Coliphage as pressure surrogates for enteric viruses in foods, Innovative Food Science & Emerging Technologies, In Press, Corrected Proof, Available online 17 July 2009, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.07.004.
(http://www.sciencedirect.com/science/article/B6W6D-4WSRF4F-1/2/680e6bd1535e32180d2eb452d3396fc4)
Abstract:
In this study the potential of using selected bacteriophages as pressure surrogates for hepatitis A virus (HAV) and Aichi virus (AiV) was investigated. The coliphages included, T4, MS2, Q[beta], [lambda] imm 434, [lambda] cI 857 and [lambda] cI 857A. T4 displayed similar pressure responses

as HAV and was chosen for further study. The most pressure-resistant phage, MS2, was selected as a possible surrogate to estimate AiV inactivation by high pressure processing (HPP). HAV, AiV and their selected bacteriophage surrogates were treated at a range of pressures and times in three different media. All four were treated in phosphate-buffered saline (PBS), artificial seawater (ASW) or oyster slurry (OS) at 250, 400 or 500 MPa for 1, 5 or 10 min at 20 [degree sign]C. While T4 had similar pressure resistance to HAV under conditions of high (500 MPa) and lower pressure (250 MPa), inactivation trends were very different following treatment at 400 MPa and when the viruses were suspended in OS. MS2 showed similar resistance as AiV but at ambient treatment temperatures only. The highest levels of inactivation of MS2 were achieved at 60 [degree sign]C and 500 MPa. AiV was eliminated at 60 [degree sign]C for 5 min at ambient pressure, but > 3 log survived exposure to 60 [degree sign]C at 500 MPa. This degree of protection by pressure may be important in determining the mechanisms of pressure and heat resistances in other viruses.Industrial relevance
Greater knowledge of the responses of viruses and their surrogates to high pressure will aid in the validation of new high pressure-processed food that may be at risk to contamination from HAV or other enteric viruses.
Keywords: High pressure; Hepatitis A virus; Aichi virus; Oysters; Surrogates; Coliphage

M.J. Lerma-Garcia, J.M. Herrero-Martinez, E.F. Simo-Alfonso, Carla R.B. Mendonca, G. Ramis-Ramos, Composition, industrial processing and applications of rice bran [gamma]-oryzanol, Food Chemistry, Volume 115, Issue 2, 15 July 2009, Pages 389-404, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.01.063.
(http://www.sciencedirect.com/science/article/B6T6R-4VG7MV7-B/2/79b029923fa108d1e71cfea5db26d31e)
Abstract:
Rice bran oil (RBO) (20-25 wt% in rice bran) is a unique rich source of commercially-important bioactive phytochemicals, most of them of interest in nutrition, pharmacy and cosmetics. The unsaponifiable constituents of RBO include mainly tocols (vitamin E, 0.10-0.14%) and [gamma]-oryzanol (esters of trans-ferulic acid with sterols and triterpenic alcohols, 0.9-2.9%). The following topics concerning [gamma]-oryzanol are reviewed: analytical methods for characterisation and determination; influence of genetic and environmental factors on the composition of rice bran; extraction approaches, including supercritical CO2 and subcritical water; and biomedical and industrial applications, including food and pharmaceuticals. Concentration ranges of [gamma]-oryzanol, tocopherols and tocotrienols found in rice bran and RBO from different varieties and geographical areas are summarised. This review focuses on the 2003-2008 period, where an average of 13-14 references per year were published; however, some relevant work reported during the 1998-2002 period is also briefly commented upon.
Keywords: Cholesterol; Ferulic acid; Frying products; [gamma]-Oryzanol; Phytosterolsl; Rice bran oil; Sterols; Triterpenic alcohols

Fang Zhong, Meng Yu, Changrong Luo, Charles F. Shoemaker, Yue Li, Shuqin Xia, Jianguo Ma, Formation and characterisation of mint oil/S and CS/water microemulsions, Food Chemistry, Volume 115, Issue 2, 15 July 2009, Pages 539-544, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.12.048.
(http://www.sciencedirect.com/science/article/B6T6R-4V75YY4-2/2/bb29381268e74226a108dcbe173a5c30)
Abstract:
Preparation and characterisation of microemulsions (ME) with mint oil (MO) as the oil phase were conducted to find a system which could provide a controlled, sustained, and prolonged delivery of MO. The influence of surfactant type and processing parameters on the formation of MO-ME's was studied by comparing the areas of the monophase ME regions in pseudoternary phase diagrams.

A 1:1 mixture of the surfactants, AOT and CrEL, was found to be the most effective, and it produced a ME monophase area of about 70%. The monophase regions were analysed by conductivity measurements; the results suggested that O/W regions within the ME phases were formed when the water content was higher than 60-65%. As tested with dynamic light scattering (DLS) and head space (HS) GC analysis, the particle size of O/W ME, with 60% water and AOT/CrEL = 1:1 as surfactants, was 20.0 nm and the encapsulation efficiency was 78.4%. The results indicated that a ME of MO/AOT and CrEL/ethanol/water, may be a promising dispersion for the protection of MO in food products.
Keywords: Mint oil; Microemulsion; Phase diagram; Encapsulation efficiency

Nicolas Giret, Franck Peron, Laurent Nagle, Michel Kreutzer, Dalila Bovet, Spontaneous categorization of vocal imitations in African grey parrots (Psittacus erithacus), Behavioural Processes, In Press, Corrected Proof, Available online 8 July 2009, ISSN 0376-6357, DOI: 10.1016/j.beproc.2009.07.001.
(http://www.sciencedirect.com/science/article/B6T2J-4WPTXNM-4/2/ef3f2385eeb9735b5f408107139db88f)
Abstract:
The ability to categorize elements of the environment is a fundamental aspect of information processing. Many experiments demonstrate the ability of birds and non-human primates to classify items according to their perceptual similarities. Few data are available regarding spontaneous classification of items according to a non-perceptual account in non-human animals. Here, we report unexpected results obtained with African grey parrots learning the referential use of French labels. Parrots did not learn the correct labels but they spontaneously produced more labels corresponding to food when a food item was presented to them and more labels corresponding to an object when shown an object item, although they were never rewarded for doing so. These results demonstrate a form of spontaneous categorization by using vocal imitation of the human language.
Keywords: Categorization; African grey parrots (Psittacus erithacus); Vocal imitation; Concept learning

Maud Petitot, Joel Abecassis, Valerie Micard, Structuring of pasta components during processing: Impact on starch and protein digestibility and allergenicity, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 8 July 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.06.005.
(http://www.sciencedirect.com/science/article/B6VHY-4WPTXM9-1/2/52027ca311a3b519154912baa018c888)
Abstract:
Pasta is a staple food known to have a low glycaemic index. This interesting nutritional property can be attributed to its specific structure, obtained after successive structural changes of its two main components, i.e. starch and proteins. This paper describes the state of art on protein and starch structuring during pasta processing and the inherent consequences on starch digestibility but also on protein digestibility and allergenicity. This review highlights the need for a multidisciplinary approach for the rational design of pasta, in order to control digestion and nutrient absorption through the food structure.

Loretta M. Friedrich, Renee Goodrich-Schneider, Mickey E. Parish, Michelle D. Danyluk, Mitigation of Alicyclobacillus spp. spores on food contact surfaces with aqueous chlorine dioxide and hypochlorite, Food Microbiology, In Press, Corrected Proof, Available online 3 July 2009, ISSN 0740-0020, DOI: 10.1016/j.fm.2009.06.011.
(http://www.sciencedirect.com/science/article/B6WFP-4WNRK1H-1/2/c9ac8b47d393277d6f80bc78947bfde3)

Abstract:
The prevalence of Alicyclobacillus spp. and other spore-forming spoilage organisms in food handling and processing environments presents a sanitation challenge to manufacturers of products such as juices and beverages. The objectives of this study were to determine the efficacy of chlorine dioxide and sodium hypochlorite in killing Alicyclobacillus spores in situ and to evaluate the efficacy of various chlorine dioxide and hypochlorite sanitizing regimes on Alicyclobacillus spp. spores on stainless steel, wood, and rubber conveyor material. Five or two log CFU/ml spore concentrations were left in aqueous solution or inoculated onto stainless steel, rubber, or wood coupons and challenged with sanitizer for varied time intervals. After treatment, the coupons were placed in sterile sample bags, massaged with neutralizing buffer, and enumerated on Ali agar. Surfaces were also examined before and after treatment by scanning electron microscopy to confirm destruction or removal of the spores. For both five and two log CFU/ml spore concentrations, treatments of 50 and 100 ppm of chlorine dioxide and 1000 and 2000 ppm of hypochlorite, respectively, were the most effective. Of the range of chlorine dioxide concentrations and contact time regimes evaluated for all surfaces, the most effective concentration/time regime applied was 100 ppm for 10 min. Reductions ranged from 0 to 4.5 log CFU/coupon. Chlorine dioxide was least effective when applied to wood. Hypochlorite was not efficient at eliminating Alicyclobacillus spores from any of the food contact surfaces at any time and concentration combinations tested. Chlorine dioxide is an alternative treatment to kill spores of Alicyclobacillus spp. in the processing environment.
Keywords: Alicyclobacillus; Chlorine dioxide; Hypochlorite; Food contact surface; Sanitizer

Lara D. LaDage, Becky J. Riggs, Barry Sinervo, Vladimir V. Pravosudov, Dorsal cortex volume in male side-blotched lizards, Uta stansburiana, is associated with different space use strategies, Animal Behaviour, Volume 78, Issue 1, July 2009, Pages 91-96, ISSN 0003-3472, DOI: 10.1016/j.anbehav.2009.03.020.
(http://www.sciencedirect.com/science/article/B6W9W-4W8KHR3-1/2/24d1065ee84a38d19401da50fa8fbb75)
Abstract:
Spatial abilities have been associated with many ecologically relevant behaviours such as territoriality, mate choice, navigation and acquisition of food resources. Differential demands on spatial abilities in birds and mammals affect the hippocampus, the region of the brain responsible for spatial processing. In some bird and mammal species, higher demands on spatial abilities are associated with larger hippocampal volumes. The medial and dorsal cortices are the putative reptilian homologues of the mammalian hippocampus, yet few studies have examined the relationship between these brain areas and differential spatial use strategies in reptiles. Furthermore, many studies in birds and mammals compare hippocampal attributes between species that use space differently, potentially confounding species-specific effects with effects due to differential behaviours in spatial use. Here, we investigated the relationship between spatial use strategies and medial and dorsal cortical volumes in males of the side-blotched lizard. In this species, males occur in three different morphs, each morph using different spatial niches: large territory holders, small territory holders and nonterritory holders with home ranges smaller than the territories of small territory holders. We found that large territory holders had larger dorsal cortical volumes relative to the remainder of the telencephalon compared with nonterritorial males, and that small territory holders were intermediate. These results suggest that some aspect of holding a large territory may place demands on spatial abilities, which is reflected in a brain region thought partially responsible for spatial processing.
Keywords: dorsal cortex; hippocampus; side-blotched lizard; spatial use; Uta stansburiana

J.A. Saunders, K.A. Rosentrater, Survey of US fuel ethanol plants, Bioresource Technology, Volume 100, Issue 13, July 2009, Pages 3277-3284, ISSN 0960-8524, DOI: 10.1016/j.biortech.2009.01.071.
(http://www.sciencedirect.com/science/article/B6V24-4VVGGT4-4/2/f53c91ab576c55d74c322ae61c00c35d)
Abstract:
The ethanol industry is growing in response to increased consumer demands for fuel as well as the renewable fuel standard. Corn ethanol processing creates the following products: 1/3 ethanol, 1/3 distillers grains, and 1/3 carbon dioxide. As the production of ethanol increases so does the generation of its coproducts, and viable uses continually need to be developed. A survey was mailed to operational US ethanol plants to determine current practices. It inquired about processes, equipment used, end products, and desired future directions for coproducts. Results indicated that approximately one-third of plant managers surveyed expressed a willingness to alter current drying time and temperature if it could result in a higher quality coproduct. Other managers indicated hesitation, based on lack of economic incentives, potential cost and return, and capital required. Respondents also reported the desire to use their coproducts in some of the following products: fuels, extrusion, pellets, plastics, and human food applications. These results provide a snapshot of the industry, and indicate that operational changes to the current production of DDGS must be based upon the potential for positive economic returns.
Keywords: Fuel ethanol; Survey; Coproducts

Lucie Beaulieu, Jacinthe Thibodeau, Piotr Bryl, Marie-Elise Carbonneau, Characterization of enzymatic hydrolyzed snow crab (Chionoecetes opilio) by-product fractions: A source of high-valued biomolecules, Bioresource Technology, Volume 100, Issue 13, July 2009, Pages 3332-3342, ISSN 0960-8524, DOI: 10.1016/j.biortech.2009.01.073.
(http://www.sciencedirect.com/science/article/B6V24-4VV1B69-3/2/5290fb9568878243a41ab704fa5b2e73)
Abstract:
Snow crab (Chionoecetes opilio) constitutes valuable and nutritional sources of components, such as proteins, lipids and chitin. The present investigation was undertaken to evaluate the feasibility of applying a pilot scale enzymatic hydrolysis process of snow crab by-products, followed by fractionation, in order to recover enriched high-valued compounds. The yield of snow crab by-products recovered after manual processing; on a dry weight was 87.4%. The by-products (raw materials) were mainly moist (approximately 78%), and contained 42.9% proteins, 14.8% lipids, 25.7% minerals, 16.2% chitin, all expressed on a dry weight. The fatty acid profile of snow crab by-products and all fractions obtained following processing showed a higher content in mono-unsaturated fatty acids (MUFAs; approximately 50%), followed by polyunsaturated fatty acids (PUFAs; approximately 20%) and saturated fatty acids (SFAs; approximately 15%). The n - 3/n - 6 ratio was approximately 10 and represents a good index of nutritional value for snow crab oil by-products. Most protein enriched fractions demonstrate a well-balanced amino acid composition, notably the most essential amino acids. These protein fractions are characterized by biomolecules having a relatively low molecular weight (35 kDa and less) range. The enzymatic hydrolysis process developed in this study shows that snow crab by-products should to be viewed as having the potential of being identified as high-valued products. Even though the process could be optimized, it is controllable, and depending on hydrolyses conditions, the products obtained are reproducible and well defined. Results presented in this study indicate that snow crab by-products may serve as excellent nutritional components for future applications in the health and food sectors.
Keywords: Snow crab by-products; Enzymatic hydrolysis process; High-valued biomolecules

Ans De Roeck, Thomas Duvetter, Ilse Fraeye, Iesel Van der Plancken, Daniel Ndaka Sila, Ann Van Loey, Marc Hendrickx, Effect of high-pressure/high-temperature processing on chemical pectin conversions in relation to fruit and vegetable texture, Food Chemistry, Volume 115, Issue 1, 1 July 2009, Pages 207-213, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.12.016.
(http://www.sciencedirect.com/science/article/B6T6R-4V42JD8-1/2/dca6d167ad2b96ff6020a09659355de3)
Abstract:
Heat sterilization of plant derived food products entails considerable organoleptic and nutritional quality losses. For instance, texture loss of fruits and vegetables occurs, next to turgor pressure losses, mainly due to chemical changes in the cell-wall pectic polysaccharides. High-pressure sterilization, i.e. the combination of high temperature ([greater-or-equal, slanted]90 [degree sign]C) with high pressure ([greater-or-equal, slanted]500 MPa), could present a positive alternative assuring safety while minimizing quality losses. In this study, the potential of high-pressure sterilization in preserving fruit and vegetable texture was evaluated by investigating the effect of combined high-pressure/high-temperature (HP/HT) treatments on two texture related chemical pectin conversions in model sytems. First, a protocol was developed to perform reproducible kinetic studies at HP/HT under constant processing conditions. Subsequently, apple pectin solutions at pH 6.5 were subjected to different HP/HT combinations (500, 600 and 700 MPa/90, 110 and 115 [degree sign]C) and the extent of chemical demethoxylation and [beta]-eliminative depolymerization was determined. At atmospheric pressure, both zero-order reaction rate constants increased with increasing temperature. At all temperatures, demethoxylation showed a higher rate constant than [beta]-elimination. However, a temperature rise resulted in a stronger acceleration of [beta]-elimination than of demethoxylation. When combining high temperature with high pressure, [beta]-elimination was retarded or even stopped, whereas demethoxylation was stimulated. These results are very promising in the context of the texture preservation of high-pressure sterilized fruits and vegetables, as [beta]-elimination is accepted to be one of the main causes of thermal softening and low methoxylated pectin can enhance tissue strength by forming cross-links with calcium ions present.
Keywords: Pectin; Texture; Demethoxylation; [beta]-elimination; High-pressure sterilization

Maria Nilka de Oliveira, Ana Lucia Ponte Freitas, Ana Fontenele Urano Carvalho, Thereza Maria Tavares Sampaio, Davi Felipe Farias, Darlio Inacio Alves Teixeira, Sandro Thomaz Gouveia, Juliana Gomes Pereira, Mariju Marrir de Castro Catanho de Sena, Nutritive and non-nutritive attributes of washed-up seaweeds from the coast of Ceara, Brazil, Food Chemistry, Volume 115, Issue 1, 1 July 2009, Pages 254-259, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.12.004.
(http://www.sciencedirect.com/science/article/B6T6R-4V3SY90-C/2/a70b7271e3267be3f44f9ab06abf2305)
Abstract:
This study assesses the nutritive and non-nutritive attributes of washed-up seaweeds from the Brazilian coast. It covers a broad diversity of species (24 red, nine green and four brown) with reasonable levels of proteins (10-14.8%), high ash contents (13-25%), low lipids (below 1%) and high carbohydrate contents (60%). Toxic and/or antinutritional factors were detected, such as low levels of lectins (32 and 64 HU/g of meal for chicken and rabbit trypsin-treated erythrocytes, respectively), tannins (59 mg/100 g), phytic acid (0.45%), high levels of trypsin inhibitors (99.0% inhibition) and -amylase inhibitors (70.5%). The 0/80% fraction showed moderate toxicity to mice (LD50 of 63.8 mg kg-1). The presence of heavy metals such as cadmium (0.29 mg/100 g), chromium (0.23 mg/100 g), nickel (0.26 mg/100 g) and vanadium (3.56 mg/100 g) was also detected. Despite moderate toxicity and antinutritional limitations, washed-up seaweeds represent a potential food alternative for humans after appropriate processing and environmental remediation to guarantee food safety.
Keywords: Washed-up seaweeds; Nutritive attributes; Non-nutritive attributes; Food alternative

G. Essono, M. Ayodele, A. Akoa, J. Foko, O. Filtenborg, S. Olembo, Aflatoxin-producing Aspergillus spp. and aflatoxin levels in stored cassava chips as affected by processing practices, Food Control, Volume 20, Issue 7, July 2009, Pages 648-654, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.09.018.
(http://www.sciencedirect.com/science/article/B6T6S-4TMBPRS-7/2/70d52c0899522329b00d9b9d08b96060)
Abstract:
Cassava chips (cassava balls, and cassava pellets) are derived cassava products traditionally produced by farmers in sub-Saharan Africa following fermentation, and drying of fresh roots of cassava, and are widely consumed in Cameroon. Once produced, this food commodity can be stored for more than two months and contaminated by a wide array of harmful microbes. In order to assess persistence of toxigenic fungi in cassava chips, aflatoxin-producing fungi (Aspergillus flavus, Aspergillus nomius, and Aspergillus parasiticus) and aflatoxins were contrasted at regular intervals in home-stored cassava chips collected in two locations of southern Cameroon throughout a two-month monitoring period. Three hundred and forty-six isolates of aflatoxin-producing fungi were found to be associated with all samples. A. flavus contaminated more samples in both types of chips (267 isolates in 53 samples), followed by A. nomius (58 isolates in 15 samples), whereas A. parasiticus was rarest. A direct competitive Enzyme-linked immunosorbent assay (ELISA)-based method was implemented to quantify the content in aflatoxins. Eighteen of the samples contained some aflatoxins at detectable levels whereas 54 did not. The levels of aflatoxin ranged between 5.2 and 14.5 ppb. The distribution of aflatoxin in positive samples depended on 8 parameters including pH, moisture content, storage duration, types of chips, level of contamination by aflatoxin-producing fungi, processing practices and storage facilities. From analysis of variance results, only pH ($p < 0.01$), duration of storage ($p < 0.01$), population of aflatoxin-producing species (0.0001) and the chip type ($p < 0.05$) were significantly related to aflatoxin in positive samples. A stepwise regression analysis (forward selection procedure) indicated that aflatoxin levels were significantly ($p < 0.01$) correlated with processing practices, storage facilities, and storage duration of the chips.
Keywords: ELISA; Aflatoxin-producing fungi; Cassava chips; Cameroon; Storage facilities

Ingrid Ericson Jogsten, Gemma Perello, Xavier Llebaria, Esther Bigas, Roser Marti-Cid, Anna Karrman, Jose L. Domingo, Exposure to perfluorinated compounds in Catalonia, Spain, through consumption of various raw and cooked foodstuffs, including packaged food, Food and Chemical Toxicology, Volume 47, Issue 7, July 2009, Pages 1577-1583, ISSN 0278-6915, DOI: 10.1016/j.fct.2009.04.004.
(http://www.sciencedirect.com/science/article/B6T6P-4W1JW46-3/2/8ab220cfc520692988f104cfbafd7130)
Abstract:
In this study, the role that some food processing and packaging might play as a source of perfluorinated compounds (PFCs) through the diet was assessed. The levels of PFCs were determined in composite samples of veal steak (raw, grilled, and fried), pork loin (raw, grilled, and fried), chicken breast (raw, grilled, and fried), black pudding (uncooked), liver lamb (raw), marinated salmon (home-made and packaged), lettuce (fresh and packaged), pate of pork liver, foie gras of duck, frankfurt, sausages, chicken nuggets (fried), and common salt. Among the 11 PFCs analyzed, only PFHxS, PFOS, PFHxA, and PFOA were detected in at least one composite sample, while the levels of the remaining PFCs (PFBuS, PFHpA, PFNA, PFDA, PFUnDA, and PFDoDA) were under their respective detection limits. PFOS was the compound most frequently detected, being found in 8 of the 20 food items analyzed, while PFHxA was detected in samples of raw veal, chicken nuggets, frankfurt, sausages, and packaged lettuce. According to the results of

the present study, it is not sufficiently clear if cooking with non-stick cookware, or packaging some foods, could contribute to a higher human exposure to PFCs.
Keywords: Perfluorinated chemicals; Food; Cooking; Packaging; Dietary intake

Ankit Patras, Nigel P. Brunton, Sara Da Pieve, Francis Butler, Impact of high pressure processing on total antioxidant activity, phenolic, ascorbic acid, anthocyanin content and colour of strawberry and blackberry purees, Innovative Food Science & Emerging Technologies, Volume 10, Issue 3, July 2009, Pages 308-313, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.12.004.
(http://www.sciencedirect.com/science/article/B6W6D-4VB01V0-1/2/c55326cb2ea92af780897eaf6e06a079)
Abstract:
The present study was undertaken to assess the effect of high pressure treatments and conventional thermal processing on antioxidant activity, levels of key antioxidant groups (polyphenols, ascorbic acid and anthocyanins) and the colour of strawberry and blackberry purees. Bioactive compounds (cyanidin-3-glycoside, pelargonidin-3-glucoside, ascorbic acid) and antioxidant activity were measured in strawberry and blackberry purees subjected to high pressure treatment (400, 500, 600 MPa/15 min/10-30 [degree sign]C) and thermal treatments (70 [degree sign]C/2 min). Samples were assessed immediately after processing. Different pressure treatments did not cause any significant change in ascorbic acid ($p > 0.05$). In contrast, following thermal processing (P70 >= 2 min) ascorbic acid degradation was 21% ($p < 0.05$) as compared to unprocessed puree. However, no significant changes in anthocyanins were observed between pressure treated and unprocessed purees ($p > 0.05$), whereas conventional thermal treatments significantly reduced the levels ($p < 0.05$). In general, antioxidant activities of pressure treated strawberry and blackberry purees were significantly higher ($p < 0.05$) than in thermally processed samples. Colour changes were minor ([Delta]E) for pressurised purees but the differences were slightly higher for thermally treated samples. Redness of purees was well retained in high pressure treated samples. Therefore processing strawberry and blackberry by high pressure processing could be an efficient method to preserve these products quality. Hence high pressure processing (HPP) at moderate temperatures may be appropriate to produce nutritious and fresh like purees.Industrial relevance
This research paper provides scientific evidence of the potential benefits of high pressure processing in comparison to thermal treatments in retaining important bioactive compounds. Antioxidant activity (ARP), ascorbic acid, and anthocyanins after exposure to high pressure treatments (400-600 MPa) were well retained. Our results also show that redness and colour intensity of strawberry and blackberry purees were better preserved by high pressure processing than conventional thermal treatment. From a nutritional perspective, high pressure processing is an attractive food preservation technology and offers opportunities for horticultural and food processing industries to meet the growing demand from consumers for healthier food products. Therefore high pressure processed foods could be sold at a premium than their thermally processed counterparts as they will have retained their fresh-like properties.
Keywords: High pressure processing; Antioxidant compounds; Antioxidant capacity; Colour; Strawberry puree; Blackberry puree

Mohammed Aider, Damien de Halleux, Inna Melnikova, Skim acidic milk whey cryoconcentration and assessment of its functional properties: Impact of processing conditions, Innovative Food Science & Emerging Technologies, Volume 10, Issue 3, July 2009, Pages 334-341, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.01.005.
(http://www.sciencedirect.com/science/article/B6W6D-4VDY824-1/2/624991806c392d8f2579edcd30f68800)
Abstract:

In the present research two objectives were studied. The first was aimed to optimize whey cryoconcentration process by minimizing the amount of the dry matter entrapped in the ice fraction. This was possible by recycling the ice fraction. It was possible to concentrate acidic whey from 5.71 +/- 0.01% (w/w) up to 24.68 +/-0.03% (w/w) total dry matter using three cryoconcentration cycles and one recycling ice cycle. The second objective was to study the emulsifying and foaming properties of the concentrated whey as function of the cryoconcentration cycle. Results showed that emulsion stability index (ESI) of the cryoconcentrated whey increased by increasing the cryoconcentration cycle whereas the emulsion activity index (EAI) decreased. Foaming ability expressed as nitrogen volume needed to get foam volume three times higher than the initial volume increased by increasing cryoconcentration cycle and foam stability decreased by increasing the cryoconcentration cycle.Industrial relevance
Several efforts and studies have been made to increase the use of milk whey, a valuable by-product of cheese processing, especially for human nutrition. In the present work, cryoconcentration technology was used for whey recovery and valorisation as promising ingredient in the food industry.
Keywords: Acidic whey; Cryoconcentration; Stability; Functionality; Optimization; Freezing

Martin Mondor, Salih Aksay, Helene Drolet, Samira Roufik, Edward Farnworth, Joyce I. Boye, Influence of processing on composition and antinutritional factors of chickpea protein concentrates produced by isoelectric precipitation and ultrafiltration, Innovative Food Science & Emerging Technologies, Volume 10, Issue 3, July 2009, Pages 342-347, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.01.007.
(http://www.sciencedirect.com/science/article/B6W6D-4VH8B29-1/2/2213f26e54763a94816acb5bb8202b15)
Abstract:
The effect of chickpea processing (i.e. defatting, isoelectric precipitation vs ultrafiltration/diafiltration) on the composition, protein recovery and antinutritional factors of protein concentrates was studied for two varieties (Mylese and Xena). Defatting did not affect significantly the content of antinutritional factors in the flours. However, production of concentrates from defatted flours by isoelectric precipitation resulted in higher phosphorous and phenolic contents compared to the concentrates produced by the same process using the full fat flours as starting material, while trypsin inhibitor content was not affected. When processed by ultrafiltration/diafiltration, protein concentrates produced from defatted flour showed a slightly lower trypsin inhibitor content than the ones produced from full fat flours in most cases, while the inverse was true for the phosphorous content, and for the phenolic content; this effect was a function of chickpea variety. Overall, UF pH 9/DF pH 6 resulted in concentrates with the lowest phosphorous content, while isoelectric precipitation and UF pH 9/DF pH 9 resulted in concentrates with lower phenolic content compared to the ones produced by UF pH 9/DF pH 6; for both processes the trypsin inhibitor content of the concentrates remained high.Industrial relevance
Chickpea production is one of the major agricultural sectors of significant importance to Canada. Although chickpeas are grown in Canada for export, very little is exported in the value-added or processed form. Development of new extraction technologies and value-added products such as the ones presented in this paper is of interest for Canada since it would have a significant impact on the growth of the industry domestically, thus, creating opportunities to strengthen rural development in Canada. Successful implementation of these technologies would make interested Canadian companies viable competitors in the global plant protein production industry and would put Canada in a good position to enjoy a large share of this market both locally and internationally.
More specifically, we are the first research group to compare the use of isoelectric precipitation and ultrafiltration/diafiltration for the production of chickpea protein concentrates from full fat and defatted flours of Kabuli and Desi chickpea variety, and to quantify the effect of these processes on the composition and on the antinutritional factors (i.e. phytic acid, total phenolics and trypsin

inhibitors) of the resulting concentrates. Overall, it was observed that isoelectric precipitation was effective to an extent in producing concentrates with low phosphorous and phenolic contents. UF pH 9/DF pH 9 was also effective to an extent in producing concentrates with low phenolic content, while UF pH 9/DF pH 6 was more efficient in producing concentrates with low phosphorous content. High-quality chickpea protein concentrates with improved nutritional properties and good functional properties could beneficially be combined with other protein sources, such as soy protein, or be used in the formulation of foods, such as meat analogues, dairy, and bakery products.
Keywords: Antinutritional factors; Chickpea; Isoelectric precipitation; Protein concentrate; Ultrafiltration

Jorge H. Behrens, Maria N. Barcellos, Lynn J. Frewer, Tatiana P. Nunes, Mariza Landgraf, Brazilian consumer views on food irradiation, Innovative Food Science & Emerging Technologies, Volume 10, Issue 3, July 2009, Pages 383-389, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.01.001.
(http://www.sciencedirect.com/science/article/B6W6D-4VDS8GN-1/2/3ea673462e452b937188acadac5f48fc)
Abstract:
This study investigated the consumer attitude to food irradiation in Sao Paulo, Brazil, through a qualitative research perspective. Three focus groups were conducted with 30 consumers, responsible for food choices and purchases. Both irradiated and nonirradiated food samples were served in the sessions to motivate the discussion and elicit the participants' knowledge, opinions, feelings and concerns towards the irradiation process. Reactions were similar among the groups and differences between the irradiated and the nonirradiated samples were hardly perceived. When provided with positive information about irradiation and its benefits to foods and human health, many people still remained suspicious about the safety of the technology. Risk perception seemed to be related to unease and lack of knowledge about nuclear power and its non-defense use. Participants claimed for more transparency in communication about risks and benefits of irradiated foods to the human health, especially with respect to the continued consumption.Industrial relevance
Irradiation is an emerging food processing technology, which has been gaining interest by food technologists, producers and manufacturers all over the world in the last decades. Irradiation is suitable for disinfestation, microorganism load reduction or sterilization, assuring the safety, as well as having benefits in the shelf-life of foodstuffs.
Food irradiation is approved in many countries and its use in food processing is endorsed by several reputed authorities, such as FAO and USDA. Despite the approval and recommendation, this technology still remains underutilized not only in Brazil, but also in other countries. The main reason appears to be the consumer concerns and doubts about the use of radiations in food processing. To develop communication strategies in promotion of irradiated foods it is necessary to investigate consumer attitudes, knowledge, opinions, as well as fears, with respect to the use of radiation in food processing.
It is well-known that consumer views on technology may vary from a culture to another. So, findings from consumer research in a country may certainly not reflect the consumer views in other countries. In this sense, Brazilian studies focused on consumer views on food irradiation are necessary to gain understanding on how the local market accepts the technology. Brazil is one of the most important food producers in the world and an emerging consumer market with a population of about 184 million people. Food irradiation is regulated in Brazil since 1973, but to date only a few food ingredients are subjected to irradiation. The wide use of irradiation in food processing would favor Brazilian producers in the quality and safety assurance of food products, both for the local market and for exports.
Keywords: Irradiation; Consumer research; Risk perception

John Shi, Sophia Jun Xue, Ying Ma, Dong Li, Yukio Kakuda, Yubin Lan, Kinetic study of saponins B stability in navy beans under different processing conditions, Journal of Food Engineering, Volume 93, Issue 1, July 2009, Pages 59-65, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.12.035.
(http://www.sciencedirect.com/science/article/B6T8J-4VDH8PM-1/2/920e97e90f3047b5a038e06175ec6cd1)
Abstract:
Saponins are rich in the legumes which are known to provide many health benefits for human beings. Saponin B is the main component in the saponins group present in navy beans. The stability of saponin B during food processing is a key issue in evaluating the quality and nutrition of food products. The effects of different soaking and cooking methods and conditions on the stability of saponin B were investigated. The effects of the soaking process on saponin reduction followed a first order kinetic model. The soaking time and the seed-to-water ratio significantly affected the stability of saponin B during the soaking process. Short time soaking and lower seed-to-water ratio would keep more saponin B in the soaked beans. The cooking medium and methods greatly influenced saponin B degradation during cooking. Water-oil mixed cooking media enhanced saponins stability in the seeds during the cooking process, as compared to a water-only cooking medium. Combined soaking and ordinary cooking induced more saponin degradation in ordinary cooked seed samples. An autoclave cooking method eliminated most of the saponin B from the autoclaved beans.
Keywords: Navy bean; Saponins; Kinetic degradation; Soaking; Thermal processing

A. Abakarov, Yu. Sushkov, S. Almonacid, R. Simpson, Thermal processing optimization through a modified adaptive random search, Journal of Food Engineering, Volume 93, Issue 2, July 2009, Pages 200-209, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.01.013.
(http://www.sciencedirect.com/science/article/B6T8J-4VGWJMV-3/2/3fd49df444a56499410d8f760ecef7ef)
Abstract:
This research suggests a modification of the adaptive random search method. The proposed modification is based on the utilization of the well-known logistic function or logistic curve in order to improve the random search adaptation characteristics. The algorithm tested results show the advantage of the random search modification over the previous random search organization, especially in the case of solving the multi-modal optimization problems. An interesting and important food industry optimization problem, such as thermal processing, was solved by the new organization of adaptive random search.
Keywords: Global optimization; Thermal processing; Random search; Logistic curve

Itaru Sotome, Makiko Takenaka, Shigenobu Koseki, Yukio Ogasawara, Yoshitaka Nadachi, Hiroshi Okadome, Seiichiro Isobe, Blanching of potato with superheated steam and hot water spray, LWT - Food Science and Technology, Volume 42, Issue 6, July 2009, Pages 1035-1040, ISSN 0023-6438, DOI: 10.1016/j.lwt.2009.02.001.
(http://www.sciencedirect.com/science/article/B6WMV-4VKDN2H-2/2/d19ece3dd9496696f93a84862dff51ea)
Abstract:
A heating system using superheated steam (SHS) and a spray of hot water microdroplets (WMD) has been developed to prevent drying of food material during SHS heating. Blanching of potato was examined with the new system (SHS + WMD), SHS, and hot water. In SHS + WMD heating, a mixture of SHS at 115 [degree sign]C, 2.46 kg/h flow rate and hot water at 0.54 kg/h was used. In SHS heating, the flow rate and temperature of the SHS were 3.0 kg/h and 115 [degree sign]C. The temperature of the hot water was approximately 100 [degree sign]C. Potato tissue processed with

hot water became soft and brittle, and its brightness and chromatic quality decreased due to absorption of water and dissolution of solid content to the water. In contrast, these quality changes were prevented in SHS + WMD and SHS heating. Heat transfer by SHS was enhanced by the presence of WMD, presumably because the water layer formed on the potato by condensation of SHS was stirred and its thermal resistance was decreased by collisions of WMD with the potato. The mass of potato processed with SHS + WMD was almost constant during the heating, while the relative mass of potato processed with SHS decreased to 96.7% with 16 min of heating.
Keywords: Peroxidase; Polyphenol oxidase; Storage; Thermal processing; Vapor-liquid two-phase flow

Paul A. Klockow, Kevin M. Keener, Safety and quality assessment of packaged spinach treated with a novel ozone-generation system, LWT - Food Science and Technology, Volume 42, Issue 6, July 2009, Pages 1047-1053, ISSN 0023-6438, DOI: 10.1016/j.lwt.2009.02.011.
(http://www.sciencedirect.com/science/article/B6WMV-4VNK5D9-2/2/c9983de77822583fdefb53b80a6082b1)
Abstract:
The quality and safety of packaged salad are major concerns to consumers. Ozone gas is a non-thermal processing technology capable of treating food to reduce pathogens. The ozone generation system (PK-1) used in this study consisted of a pair of electrodes with an adjustable gap inside a package. Individual, fresh, prepackaged, whole spinach leaves inoculated with Escherichia coli O157:H7 6460 were treated in packaging with ozone generated in air and oxygen. Samples were treated for 5 min and stored at room temperature (22 [degree sign]C) or refrigeration (5 [degree sign]C) for 0.5, 2, and 24 h. Gas composition and relative humidity were measured. All treated samples showed reductions in E. coli O157:H7 populations with the largest reductions (3-5 log10 CFU/leaf) after 24 h of storage. After 5 min of treatment, ozone concentrations were 1.6 and 4.3 mg/L for air and oxygen gas, respectively. The concentrations of ozone decreased with time and were not detectable after 24 h. A 5-point Spinach Color Quality (SCQ) scale was established (5-best, 1-worst). Treated spinach showed discoloration with SCQ-values of 3.83 and 1.00 for air and oxygen gas exposed leaves after 24 h. These results indicate that the PK-1 system is capable of reducing E. coli O157:H7 in packaged spinach; however, minimizing quality changes after treatment requires further research.
Keywords: Spinach; Ozone; Decontamination; Packaging; E. coli O157:H7

S.M. Ghoreishi, R. Gholami Shahrestani, Innovative strategies for engineering mannitol production, Trends in Food Science & Technology, Volume 20, Issues 6-7, July 2009, Pages 263-270, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.03.006.
(http://www.sciencedirect.com/science/article/B6VHY-4VY2C6P-1/2/ee43551b085688092fcf3a13ead7e51c)
Abstract:
Mannitol is an important polyol which is being used mainly in the food and pharmaceutical industries. The current techniques for the production of mannitol are reviewed. The present commercial production of d-mannitol takes place by hydrogenation reaction. The low d-mannitol yield, however, asks for the development of alternative procedures. The shortcomings and major drawbacks of commercial conventional methods and the potential prospects and incentives of new developing techniques such as supercritical and subcritical fluid extraction, and microorganism processing are discussed. Furthermore, important research obstacles and challenges in the development of an alternative technology for the mannitol production are pinpointed.

Arnout R.H. Fischer, Lynn J. Frewer, Consumer familiarity with foods and the perception of risks and benefits, Food Quality and Preference, In Press, Corrected Proof, Available online 27 June 2009, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2009.06.008.

(http://www.sciencedirect.com/science/article/B6T6T-4WMDHGW-1/2/4b677cfb304187392a718ba9cd12fb5d)
Abstract:
Differences in familiarity with food products may influence how information about the risks and benefits about foods is used in forming risk and benefit perceptions. In two experimental studies, the risk and benefit perceptions of student participants, for four foods (familiar or unfamiliar) were assessed. In experiment 1, participants had the option to voluntarily request information (N = 106). In experiment 2, participants were involuntarily exposed to varying amounts of risk and benefit information (N = 235). In the first experiment, risk and benefit perceptions for unfamiliar foods were the result of an ad hoc affect or attitude being formed from whatever information about a food was presented first. The second experiment confirmed these results. The asymmetry between risk and benefit perception can be understood in terms of prior attitude and primacy effects. The greater importance of risk information in the development of risk perception is shown, compared to the greater importance role of familiarity with foods for benefit perception. It is argued that risk and benefit perceptions associated with foods may be dependent on different psychological processes. Risk perception is more likely to be derived from deliberative information processing. Benefit perception is derived from heuristic information processing and personal experience.
Keywords: Risk perception; Benefit perception; Product familiarity; Risk communication

Caroline Le Gentil, Yahaya Sylla, Christine Faille, Bacterial re-contamination of surfaces of food processing lines during cleaning in place procedures, Journal of Food Engineering, In Press, Corrected Proof, Available online 27 June 2009, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.06.040.
(http://www.sciencedirect.com/science/article/B6T8J-4WMDHCM-1/2/dd783199e7e4ca00931fb417293fc7e7)
Abstract:
The possible contamination of surfaces of food processing lines during cleaning in place (CIP) procedures was investigated. Experiments were focused on surface contamination of straight pipes and a two-way valve, chosen as an example of complex pieces of equipment. Pipes and a two-way valve were inserted into a CIP rig, at the same time as a series of pipes highly contaminated with spores of three Bacillus cereus strains, with various surfaces properties. Following a CIP procedure, performed in conditions close to those encountered in food industries, the contamination level of the various items was estimated. A significant surface contamination occurring during CIP was evidenced, depending on the spore surface properties. Similarly to previously reported observations, when spores were suspended in optimal adhesion conditions (suspension in water at 20 [degree sign]C), the re-adhesion phenomenon was controlled by the flow pattern and contamination levels inside the valve were significantly higher than in tubes. Cleaning strategies should therefore take into account the re-adhesion phenomenon to limit the risk of contamination by the process line.
Keywords: Cleaning in place; Detachment kinetics; Bacillus cereus spores; Re-adhesion; Process line design; Surface contamination

Ji luan Chen, Jing Zhang, Lijun Song, Ying Jiang, Jihong Wu, Xiao Song Hu, Changes in microorganism, enzyme, aroma of hami melon (Cucumis melo L.) juice treated with dense phase carbon dioxide and stored at 4 [degree sign]C, Innovative Food Science & Emerging Technologies, In Press, Accepted Manuscript, Available online 26 June 2009, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.06.003.
(http://www.sciencedirect.com/science/article/B6W6D-4WM7539-1/2/5e64a4f04334bfb2505991441fbc0439)
Abstract:

The effects of dense phase carbon dioxide (DP-CO2) treatment of 8, 15, 22, 30 and 35 MPa for 5 min，15 min，30 min，45 min，60 min at 35 [degree sign]C，45 [degree sign]C，55 [degree sign]C，65 [degree sign]C on microorganism, enzyme, and aroma compounds in hami melon juice during storage at 4 [degree sign]C for 4-weeks were investigated. Meanwhile, the color, browning degree, and Vitamin C were also studied. The DP-CO2 treatment had significant effects on inactivation of microorganism and enzyme. It was indicated that higher pressure caused more inactivation of microbial total count and enzyme activity. When it reached 35Mpa, 55 [degree sign]C，60 min, the microorganism was totally inactivated. The least residual activity of of polyphenol oxidase (PPO), peroxidase (POD), and lipoxygenase (LOX) was 25.26%, 38.46 and 0.02% at 35MP, respectively. The restoration of PPO, POD and LOX residual activity after DP-CO2 treatment was also observed, which was dependent on the pressure level. The aroma compounds were less affected after being treated with DP-CO2, and the flavor of the melon juice was close to the fresh juice after storage at 4 [degree sign]C for 4 weeks and did not produced cook off-odor. The changes of lightness L and browning degree A during storage were well fitted to a first-order kinetic model. The Vitamin C concentration decreased by DP-CO2 processing, but this loss was lower than of the untreated sample.Industrial relevance
Hami melon is highly appreciated for its nutritional quality and special flavor. The flesh of melon is heat sensitive, the sensitive nutrients, color and aromatic profile will be spoiled greatly or off-odour when it was produced with high temperature treatment. Dense phase carbon dioxide processing (DP-CO2) is important to find an innovative food process to inactivate the enzyme and microorganism and protect the nutrient and unique flavor. In this study, the data proved that DP-CO2 processing is a promising non-thermal alternative pasteurization to preserved fresh-squeezed melon juice.
Keywords: Hami melon (Cucumis melo L.) juice; Dense phase carbon dioxide (DP-CO2); Microorganism; Enzyme; Color; Aroma compounds

Lynnette R. Ferguson, Meat and cancer, Meat Science, In Press, Corrected Proof, Available online 23 June 2009, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2009.06.032.
(http://www.sciencedirect.com/science/article/B6T9G-4WKK1SF-1/2/903d60dba6ab542f1ce7ff574604524a)
Abstract:
An increasing literature associates high intake of meat, especially red meat and processed meat with an increased risk of cancers, especially colorectal cancer. There is evidence that this risk may not be a function of meat per se, but may reflect high-fat intake, and/or carcinogens generated through various cooking and processing methods. The cancer risk may be modulated by certain genotypes. Cancers associated with high meat consumption may be reduced by the addition of anticarcinogens in the diet, especially at the same time as meat preparation or meat consumption, or modification of food preparation methods. Meat contains potential anticarcinogens, including omega-3 polyunsaturated fatty acids, and conjugated linoleic acid (CLA). Red meat, in particular, is an important source of micronutrients with anticancer properties, including selenium, vitamin B6 and B12, and vitamin D. Adjusting the balance between meat and other dietary components may be critical to protecting against potential cancer risks.
Keywords: Meat; Fat; Heterocyclic amine; Polycyclic aromatic hydrocarbon; Heme iron; Wheat bran

Victor Ladero, Maria Fernandez, Miguel A. Alvarez, Effect of post-ripening processing on the histamine and histamine-producing bacteria contents of different cheeses, International Dairy Journal, In Press, Corrected Proof, Available online 17 June 2009, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2009.05.010.

(http://www.sciencedirect.com/science/article/B6T7C-4WJBBSD-1/2/a9efc6fca2b60a2270cb4672240b1fd8)
Abstract:
Histamine is the most active biogenic amine and the one most commonly involved in food-borne intoxications. In this work, the effect of the post-ripening processing (cutting, slicing and grating) of different types of cheese on their histamine and histamine-producing bacteria contents was analysed. The average histamine content detected in Emmental cheeses was 220.8 mg kg-1; the highest concentrations (up to 734.1 mg kg-1) were recorded in grated samples. Significantly more histamine-producing bacteria were detected by real-time quantitative PCR (RT-qPCR) in the post-ripening-processed samples than in entire cheeses in all the cheese types analysed. A good association was obtained between the number of histamine-producing bacteria determined by RT-qPCR and histamine concentrations as determined by HPLC. Results for the analysis of entire Emmental cheeses and their post-ripening processed products suggested that processing had an important influence on the presence of histamine in cheese.

Lan T.T. Bui, Darryl M. Small, Riboflavin in Asian noodles: The impact of processing, storage and the efficacy of fortification of three product styles, Food Chemistry, Volume 114, Issue 4, 15 June 2009, Pages 1477-1483, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.11.048.
(http://www.sciencedirect.com/science/article/B6T6R-4V166FY-3/2/83ff8a09467579f5265f33b7d2a72453)
Abstract:
Asian noodle products are a staple food in many countries, representing the end-use of approximately one eighth of all wheat produced globally. Relatively little has been published on the contribution of Asian noodles to dietary intakes of essential nutrients including the B group vitamins. Therefore, the aim of this study has been to investigate the factors influencing the retention of riboflavin in these products. The three most common styles of Asian noodles (white salted, yellow alkaline and instant) have been prepared under controlled laboratory conditions and riboflavin contents measured at each stage of processing. The stability varied markedly between the different styles with losses occurring at each step. Declines ranging from 27% to 38% of the initial riboflavin levels were found in fortified noodles prior to cooking. During boiling at the optimum temperature, further decreases occurred resulting in overall losses of 52-74% of the amounts incorporated into the various formulations. The presence of alkaline salts as ingredients appeared to be the primary factor influencing the extent of losses in the three styles. White salted and instant Asian noodles are effective vehicles for enhancing dietary intakes of riboflavin.
Keywords: Riboflavin; Asian noodles; Fortification; Micronutrients; Vitamin retention

M.A. Bollen, H.J. Wichers, J.P.F.G. Helsper, H.F.J. Savelkoul, M.A.J.S. van Boekel, Thermodynamic characterization of the PR-10 allergens Bet v 1, Api g 1 and Dau c 1 and pH-dependence of nApi g 1 and nDau c 1, Food Chemistry, In Press, Corrected Proof, Available online 13 June 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.06.013.
(http://www.sciencedirect.com/science/article/B6T6R-4WHFDB3-8/2/ebd38995102cea88ff4c703060844acb)
Abstract:
Natural and recombinant Bet v 1, the major birch pollen allergen, and homologous allergens, Api g 1 and Dau c 1, from celery and carrot, respectively, were studied by CD spectroscopy under conditions of varying denaturant concentration, pH and temperature to determine fundamental thermodynamic parameters for conformational stability. Thermodynamic studies increase basic knowledge regarding differences between birch pollen-related allergens and are of importance in choosing processing conditions. The conformational stability determined from guanidine hydrochloride denaturation curves was similar for rBet v 1.0101 and rApi g 1.0101. Conformational responses to chaotropic salt were different for recombinant allergens from different species, but

were similar for the natural isoform mixtures. The conformational stabilities of nApi g 1 and nDau c 1, were shown to be similar to rBet v 1.2801 at pH > 4.4 [Mogensen, J. E., Ipsen, H., Holm, J., & Otzen, D. E. (2004). Elimination of a misfolded folding intermediate by a single point mutation. Biochemistry, 43(12), 3357-3367], but nApi g and nDau c 1 were stable to heating at lower pH-values.
Keywords: Api g 1; Bet v 1; Birch pollen; Dau c 1; Food allergy; Protein stability

Andreja Rajkovic, Nada Smigic, Mieke Uyttendaele, Helga Medic, Lieven de Zutter, Frank Devlieghere, Resistance of Listeria monocytogenes, Escherichia coli O157:H7 and Campylobacter jejuni after exposure to repetitive cycles of mild bactericidal treatments, Food Microbiology, In Press, Corrected Proof, Available online 13 June 2009, ISSN 0740-0020, DOI: 10.1016/j.fm.2009.06.006.
(http://www.sciencedirect.com/science/article/B6WFP-4WHFD5J-1/2/1a5ab2b38eecbc4cf110a42f231896e7)
Abstract:
While maintaining nutritional and sensorial attributes of fresh foods mild processing technologies generally deliver microbiologically perishable food products. Currently little information exists on possible increase in the resistance of pathogens after repetitive exposure to mild (sub-lethal) treatments. Multiple strain-cocktails of Listeria monocytogenes, Escherichia coli O157:H7 and Campylobacter jejuni were exposed to 20 consecutive cycles of sub-lethal inactivation by three different techniques. Used techniques comprised inactivation with lactic acid (LA), chlorine dioxide (ClO_2) and intense light pulses (ILP). Results showed that the selection of resistant cells was both species and technique dependent. While repetitive cycles of ClO_2 treatment did not result in increased resistance, repetitive inactivation with LA yielded L. monocytogenes culture of higher resistance in comparison to the parental culture. The increased resistance, expressed as decreased level of reduction in bacterial counts in subsequent inactivation cycles, was also observed with ILP for both L. monocytogenes and E. coli O157:H7 strains. Visual trend observations were confirmed through statistical linear regression analysis. No such effects were noted for C. jejuni which became undetectable after first 2-5 cycles. Current findings indicate the ability of foodborne pathogens to adapt to mild bactericidal treatments creating new challenges in risk assessment and more specifically in hazard analysis.
Keywords: Mild bactericidal treatments; Increased resistance; Listeria monocytogenes; Escherichia coli O157:H7; Campylobacter jejuni

U. Tiwari, E. Cummins, Nutritional importance and effect of processing on tocols in cereals, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 13 June 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.06.001.
(http://www.sciencedirect.com/science/article/B6VHY-4WHFD4V-1/2/0a0ec94d84e28b6e28994711729ae3de)
Abstract:
Over the past decade greater consumer demand for nutritious cereal-based food products with minimal artificial additives has been met with increased research and development from the food industry. Recent research has highlighted the importance of tocols in human health and nutrition. Tocols are natural antioxidants present in food of plant origin, including cereals. Cereal and cereal-based foods (breakfast cereals, bread, cookies, extruded snacks, etc.) are common and widely consumed in many parts of the world. Available literature reveals that the level of tocols in a finished product depends upon the food processing operations carried out. For example, milling of cereal grains and subsequent baking may have a major impact on tocol levels in the final product. Food manufacturing procedures could incorporate the pearling by-products of cereals, which are rich in tocols, and hence increase the nutrition and health benefits of the end product (e.g. bread). In this study the role of tocols, from various cereal sources and cereal-based products, on human

health are reviewed. Factors influencing levels and stability during processing and storage are also discussed.

Xingfeng Guo, Shaojun Tian, Darryl M. Small, Generation of meat-like flavourings from enzymatic hydrolysates of proteins from Brassica sp., Food Chemistry, In Press, Corrected Proof, Available online 11 June 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.05.089.
(http://www.sciencedirect.com/science/article/B6T6R-4WH2M66-1/2/40ec986c0171811132c38b6524cd1145)
Abstract:
Proteins from Brassica sp. were prepared by alkaline extraction followed by acid precipitation. A double-enzyme (As1.398 and Flavourzyme) two-stage hydrolysis was used to hydrolyse Brassica sp. proteins, and the hydrolysates were used to generate meat-like flavourings. The effect of processing conditions on the volatile products generated from the thermal reaction between the protein hydrolysates and other additives was studied. The results indicated that temperature and pH influenced not only the number but also the amount of products. Those with the most favourite flavour and the highest volatile amount were generated at 160 [degree sign]C, pH 4.0, whereas a burnt odour was produced at 180 [degree sign]C, pH 8.0. Analysis using response surface methodology showed that the interaction of pH and temperature had a significant influence on the total amount of volatile products ($P < 0.01$). GC-MS analysis demonstrated that most of the components in the reaction products occur in food flavourings which had been identified in model systems.
Keywords: Brassica sp.; Protein; Enzymatic hydrolysis; Generation of flavour

E.G. Evers, J. Post, F.F. Putirulan, F.J. van der Wal, Detection probability of Campylobacter, Food Control, In Press, Corrected Proof, Available online 9 June 2009, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.06.004.
(http://www.sciencedirect.com/science/article/B6T6S-4WGMB4T-3/2/4becb832033e2ad6f43c60c665142b56)
Abstract:
A rapid presence/absence test for Campylobacter in chicken faeces is being evaluated to support the scheduling of highly contaminated broiler flocks as a measure to reduce public health risks [Nauta, M. J., & Havelaar, A. H. (2008). Risk-based standards for Campylobacter in the broiler meat chain. Food Control, 19, 372-381]. Although the presence/absence test is still under development, an example data set of test results is analysed to illustrate the benefit of the detection probability concept. The detection probability of Campylobacter increases with the logarithm of the Campylobacter concentration in faeces according to an S-shaped curve which stretches about 2-3 log units. The detection probability is 50% at a Campylobacter concentration of 7.4 x 106 cfu/g. The uncertainty in the detection probability is 32% at the most for a 90% confidence interval. This type of information allows for realistic calculations on the Campylobacter status of different food processing paths after splitting. Usable quantitative estimates on detection probability await a data set of test results from a test that is ready for use or has similar properties.
Keywords: Detection probability; Food processing; Pathogen concentration; Scheduling

Maryam Ansari-Lari, Sahar Soodbakhsh, Leila Lakzadeh, Knowledge, attitudes and practices of workers on food hygienic practices in meat processing plants in Fars, Iran, Food Control, In Press, Corrected Proof, Available online 8 June 2009, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.06.003.
(http://www.sciencedirect.com/science/article/B6T6S-4WGBFKH-5/2/4cd65a954b5f7fab335ca0de6441dd09)
Abstract:

This cross-sectional study was conducted to evaluate the knowledge, attitudes and practices of food workers in four meat processing plants in the Fars province, southern Iran. A self-administered, structured questionnaire was designed and completed by 97 food workers during November 2006-January 2007. Results indicated that the respondents had acceptable level of knowledge, excellent attitudes and poor practices toward food hygiene measures. Almost all of the food workers (97.9%) were aware of the critical role of general sanitary measures in the work place while there was lack of knowledge about microbial food hazards in the majority (67-78%) of them. A significant negative correlation was observed between knowledge and practices (rs = -0.20, P = 0.04), and attitudes and practices (rs = -0.27, P = 0.009), revealing that increased knowledge and even attitudes toward food safety does not always result in positive change in food handling behaviors.
Keywords: Attitudes; Food hygiene; Iran; Knowledge; Meat plant; Practices

Xiaofang Peng, Jinyu Ma, Ka-Wing Cheng, Yue Jiang, Feng Chen, Mingfu Wang, The effects of grape seed extract fortification on the antioxidant activity and quality attributes of bread, Food Chemistry, In Press, Corrected Proof, Available online 2 June 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.05.083.
(http://www.sciencedirect.com/science/article/B6T6R-4WF4J77-6/2/2c67a46f4bf2f8a6a4c1f609540dcac9)
Abstract:
The antioxidant activity change of breads added with grape seed extract (GSE) was investigated. The results showed that bread with the addition of GSE had stronger antioxidant activity than that of blank bread, and increasing the level of GSE addition further enhanced the antioxidant capacity of the bread. However, thermal processing caused antioxidant activity of GSE added to bread to decrease by around 30-40%. We also studied the effect of GSE on the formation of detrimental N[epsilon]-(carboxymethyl)lysine (CML), a famous advanced glycation endproduct in bread. According to the results, GSE could reduce CML in bread and acted in a dose-dependent manner. Meanwhile, except for an acceptable colour change, adding GSE to bread had only little effect on the quality attributes of the bread. Altogether, our findings indicate that GSE-fortified bread is promising to be developed as a functional food with relatively lower CML-related health risks, yet a high antioxidant activity.
Keywords: Antioxidant activity; Grape seed extract; Bread; Advanced glycation endproducts

Sabine Hildebrandt, Eric A.E. Garber, Effects of processing on detection and quantification of the parvalbumin gene in Atlantic salmon (Salmo salar), Food Chemistry, In Press, Corrected Proof, Available online 2 June 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.05.074.
(http://www.sciencedirect.com/science/article/B6T6R-4WF4J77-7/2/2678d1ddbb92f95cf150d6a8675f2a77)
Abstract:
Consumption of Atlantic salmon is a common cause of fish allergies with parvalbumin (Sal s1) being the major allergen. The presence of DNA encoding Sal s1 indicates the presence of Atlantic salmon in food. Using real-time polymerase chain reaction (PCR), the effects of food processing on the ability to detect and quantify the Sal s1 gene were determined. The method was specific for salmon and did not cross-react with 53 other species. Baking and pressure cooking caused a 5-100-fold decrease in detectable copies of the Sal s1 gene. Despite a 98% reduction in detectable copies following pressure cooking for 60 min, the relative standard deviation (RSD) between replicates was 20% and the response was 100-fold grater than the lowest copy number of Sal s1 reliably detected by the assay. Despite efforts to develop a quantitative assay, the PCR assay was qualitative. It is impossible to predict the effects of food matrices not included in this study, some of which may affect the reliability of the assay. Analyses of raw and pressure cooked salmon using a commercial PCR kit indicated comparable results to the PCR assay.

Keywords: Parvalbumin; Salmon; PCR; Baking; Processing; Pressure cooking

Maria A. Martin-Cabrejas, Yolanda Aguilera, Mercedes M. Pedrosa, Carmen Cuadrado, Teresa Hernandez, Soledad Diaz, Rosa M. Esteban, The impact of dehydration process on antinutrients and protein digestibility of some legume flours, Food Chemistry, Volume 114, Issue 3, 1 June 2009, Pages 1063-1068, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.10.070.
(http://www.sciencedirect.com/science/article/B6T6R-4TVTJWR-4/2/93a46af072be33a92b2e52aa3ae7419f)
Abstract:
Dehydrated foods are specially designed for patients with mastication or/and deglutition problems. This study has assessed the effects of soaking, cooking and industrial dehydration treatments on antinutrient factors and also on protein digestibility in legume flours (chickpea, lentil and bean). A general decline of phytic acid was observed during dehydration, being the most accentuated in case of lentil (44%), followed by white beans and pink-mottled cream beans. Beans were the legumes that showed the highest levels of enzyme inhibitors and lectins, however processing such as cooking and dehydration significantly reduced ($p < 0.05$) their levels further to negligible concentrations. The dehydration did not cause further effects than ordinary cooking in reduction of the concentration of polyphenolic compounds of flours. However, a higher increase of in vitro protein digestibility (IVPD) was produced by dehydration in all legumes from 12% to 15%. Thus, dehydrated legume flours could be considered ready-to-use for special meals to specific populations.
Keywords: Dehydration process; Antinutrients; In vitro protein digestibility; Legume flours

Ahmad Cheikhyoussef, Natascha Pogori, Haiqin Chen, Fengwei Tian, Wei Chen, Jian Tang, Hao Zhang, Antimicrobial activity and partial characterization of bacteriocin-like inhibitory substances (BLIS) produced by Bifidobacterium infantis BCRC 14602, Food Control, Volume 20, Issue 6, June 2009, Pages 553-559, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.08.003.
(http://www.sciencedirect.com/science/article/B6T6S-4T7XGNJ-2/2/a314647a78ca30f3ed4814e7849c45f3)
Abstract:
Bifidobacterium infantis BCRC 14602 was found to produce a bacteriocin-like inhibitory substance (BLIS) with inhibitory activities against a wide range of Gram- positive and Gram-negative bacteria. An activity level of 400 AU/ml in the middle of the exponential phase (i.e. 6 h) and maximum activity (1600 AU/ml) at the beginning of the stationary phase (i.e. 16 h) was recorded in MRS broth at 37 [degree sign]C. BLIS was partially purified by a two-step purification protocol resulting in a specific activity of 31,605 AU/mg and a purification fold of 120. Based on Tricine-SDS-PAGE, the BLIS is approximately 3.0 kDa in size. Complete inactivation of BLIS activity was observed after treatment with proteolytic enzymes, but not with catalase, [alpha]-amylase and lipase. The adsorption of the BLIS to the producer cells was strongly affected by the pH of the broth culture of which 100% adsorption to the killed cells occured between pH 6.0 and 7.0, whereas at pH values below 6.0 and above 7.0, the adsorption ratio decreased to 43 and 60%, respectively. BLIS showed high temperature stability up to 121 [degree sign]C for 15 min with no loss in its activity, and had pH stability in the range of 4-10. The temperature and heat stability of BLIS makes it useful for applications in food processing technologies and food safety control applications.
Keywords: Bacteriocin-like inhibitory substance; Bifidobacterium infantis BCRC 14602; Bactericidal action

Concetta Tedeschi, Veronique Clement, Martine Rouvet, Baltasar Valles-Pamies, Dissolution tests as a tool for predicting bioaccessibility of nutrients during digestion, Food Hydrocolloids, Volume 23, Issue 4, Food Colloids: Creating Structure, Delivering Functionality, June 2009, Pages 1228-1235, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2008.09.012.

(http://www.sciencedirect.com/science/article/B6VP9-4TKPVG4-3/2/8d8570e0b1cc0cd45753400a465a6031)
Abstract:
Bioaccessibility and bioavailability of active ingredients (like vitamins, antioxidants, etc.) into food systems is often compromised by factors like low permeability and/or solubility within the gut, lack of stability during food processing (temperature and oxygen) as well as in the gastrointestinal tract (pH, enzymes, presence of other nutrients). Moreover, little is known on the influence of food structure and breakdown in the gut on nutrient release. The possibility of predicting the release of nutrients from food matrices under simulated gastrointestinal conditions is of great relevance in order to define which food matrix is best for which nutrient, as well as for looking at the interaction of ingredients with the enzymes involved in the digestive process. This study explores the potential relevance of dissolution tests as a tool for predicting bioaccessibility of nutrients during in vitro digestion. Whey protein hydrogels containing green tea extract (GTE) were chosen for this study. Different simulated in vitro gastrointestinal conditions (GI) were applied throughout the dissolution experiments and the GTE was analysed by UV-vis absorption spectroscopy. It was possible to distinguish between two different release kinetics when experiments were performed in simulated gastric or intestinal media. In the gastric step, the kinetic of GTE release was lower than in an intestinal environment, suggesting that more GTE is released and available for absorption into the intestine than in the stomach. The present study shows that it is possible to use the dissolution tester as a screening method to mimic nutrient release from a food matrix in the gastrointestinal tract.
Keywords: Dissolution test; Bioaccessibility of nutrients; [beta]-Lactoglobulin; Whey protein hydrogels; Green tea extract; In vitro digestion; UV-vis absorption spectroscopy

Shakuntala Ghorai, Samudra Prosad Banik, Deepak Verma, Sudeshna Chowdhury, Soumya Mukherjee, Suman Khowala, Fungal biotechnology in food and feed processing, Food Research International, Volume 42, Issues 5-6, June-July 2009, Pages 577-587, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.02.019.
(http://www.sciencedirect.com/science/article/B6T6V-4VR9FFN-9/2/03d595d1dd6f0ec05cf05ca243a6a03d)
Abstract:
Fungi are of excellent value nutritionally, and of great importance to vegetarians. Edible mushrooms are excellent sources of protein, have low-fat content and are free of cholesterol. They are easily cultivable and are consumed either in fresh or processed form. Yeasts and filamentous fungi secrete a plethora of important enzymes in the growth medium together with other secondary metabolites. Most of these are hydrolytic in nature being employed in different food processing industries as well as in refinement of fodder quality. Edible filamentous fungi producing these enzymes present an added advantage for their use in food and feed. In this article these aspects will be discussed along with the results from edible mushroom Termitomyces clypeatus, producing a wide variety of hydrolytic enzymes and products, from our laboratory. It is likely that the functional understanding of different enzyme classes will provide new applications within the food industry in the future.
Keywords: Fruiting body; Fungal biotechnology; Fungal enzymes; Bioprocessing of food; Fermentation; Mushroom; Termitomyces clypeatus; Secondary metabolites

M. Walkling-Ribeiro, F. Noci, D.A. Cronin, J.G. Lyng, D.J. Morgan, Shelf life and sensory evaluation of orange juice after exposure to thermosonication and pulsed electric fields, Food and Bioproducts Processing, Volume 87, Issue 2, June 2009, Pages 102-107, ISSN 0960-3085, DOI: 10.1016/j.fbp.2008.08.001.
(http://www.sciencedirect.com/science/article/B8JGD-4TN8BY6-1/2/de6fd7759982d6f5ffb727c0daa13be8)

Abstract:
Thermosonication (TS) and pulsed electric fields (PEF) represent emerging technologies for liquid food preservation. In the present study shelf life and sensory attributes of orange juice were evaluated following treatment with a combination of these technologies (TS/PEF). The juice was exposed to batch TS at 55 [degree sign]C for 10 min followed by continuous PEF at a field strength of 40 kV/cm for 150 [mu]s. High-temperature short-time (HTST) pasteurisation (94 [degree sign]C for 26 s) was used as a control. Sensory attributes (i.e. colour, odour, sweetness, acidity, flavour and overall acceptability) of different orange juices processed with TS/PEF or exposed to HTST pasteurisation were evaluated by 37 panellists using a hedonic scale (1-9 points). All sensory attributes were rated equivalent for TS/PEF- and HTST-treated juice ($P >= 0.05$). During the shelf life study the effect of TS/PEF on selected physical properties (pH, [degree sign]Brix and conductivity), microbiological activity and colour stability was monitored directly after processing and following 25 [degree sign]C storage up to 168 days. No significant change in the physical properties was detected after TS/PEF or HTST treatment during 168 days of shelf life ($P >= 0.05$). Although the counts for both treatments were consistently within safe levels (<1000 CFU/ml) during the 168 days of storage, overall microbial counts in TS/PEF-treated juice were higher than in thermally pasteurised juice ($P < 0.05$). Colour attributes showed significant differences between TS/PEF- and HTST-pasteurised juice throughout the shelf life study ($P < 0.05$). Although promising results have been obtained further optimisation is required in order to maximise the quality of the resulting product.
Keywords: Orange juice; Shelf life; Sensory analysis; Pulsed electric fields; Ultrasonics; Hurdle treatment

Rosemary Hoffmann-Ribani, Lisia S. Huber, Delia B. Rodriguez-Amaya, Flavonols in fresh and processed Brazilian fruits, Journal of Food Composition and Analysis, Volume 22, Issue 4, June 2009, Pages 263-268, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.12.004.
(http://www.sciencedirect.com/science/article/B6WJH-4VS405D-3/2/367b5aa172a0f583b8037956a87bc828)
Abstract:
Flavonols (myricetin, quercetin and kaempferol) and flavones (luteolin and apigenin) were determined in Brazilian fruits, using a previously optimized and validated HPLC method. The flavonoids investigated were not detected in three cultivars each of mango and papaya. Quercetin was found in all the other fruits, the mean values varying from 0.3 mg/100 g in orange cultivar Pera to 7.5 mg/100 g in apple cultivar Fuji. Kaempferol was encountered in strawberry (0.7-0.9 mg/100 g), acerola (0.9-1.2 mg/100 g), pitanga (0.4 mg/100 g) and cashew-apple (<LQ-0.3 mg/100 g). Myricetin was detected only in pitanga (3.1-3.7 mg/100 g) and cashew-apple (2.0 mg/100 g). The best sources of flavonols among the fruits investigated were pitanga, cashew-apple, acerola and apple, the first three being analyzed for the first time. Luteolin and apigenin were not detected in any of the fruits. The processed products (ready-to-drink juice, concentrated juice, frozen pulp) of acerola, cashew-apple and pitanga had appreciably lower flavonol levels than the unprocessed fruit, indicating losses during processing. Comparison with published data on apple, orange, strawberry and fig shows the need for interlaboratory evaluation of the analytical methodology and more analyses to obtain cultivar-specific data.
Keywords: Food analysis; Food composition; Flavonols; Flavones; Fruits; Cultivar differences; Processed fruits; Brazilian fruits

Teresa Leszczynska, Agnieszka Filipiak-Florkiewicz, Ewa Cieslik, Elzbieta Sikora, Pawel M. Pisulewski, Effects of some processing methods on nitrate and nitrite changes in cruciferous vegetables, Journal of Food Composition and Analysis, Volume 22, Issue 4, June 2009, Pages 315-321, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.10.025.

(http://www.sciencedirect.com/science/article/B6WJH-4VRP242-2/2/2692a540070b423e530617a59a47dbcd)
Abstract:
Changes in nitrate and nitrite content in selected cruciferous vegetables, resulting from blanching, boiling, freezing, frozen storage and boiling after previous freezing, were analyzed. The highest level of nitrate was detected in curly kale (302.0 mg/kg) and the lowest in green cauliflower (61.0 mg/kg). As for nitrite, the respective levels were found in white cauliflower (3.49 mg/kg) and green cauliflower (1.47 mg/kg). Both blanching and boiling of the cruciferous vegetables caused a considerable decrease in the total nitrate content, but at the same time no explicit changes were noted regarding the level of nitrite. In the vegetables stored frozen for 48 h, previously blanched, either an increase or no change was observed in the nitrate level, with the changes in the nitrite level being irregular. In the vegetables stored frozen for 4 months, previously blanched, generally a decrease was noted in the nitrate, and an increase in the nitrite level compared to the levels in the blanched vegetables. Boiling of the frozen vegetables (stored frozen for 48 h) most frequently caused a considerable reduction of the nitrate level in comparison to the content in the raw frozen vegetables. No changes were observed resulting from the boiling of the vegetables previously stored frozen for 4 months. Simultaneously, no explicit changes were found regarding the nitrite level in the frozen vegetable after boiling.
Keywords: Cruciferous vegetables; Blanching; Boiling; Freezing; Nitrate; Nitrite; Food processing; Cooking methods; Food contamination; Food safety; Food composition

Catherine Charcosset, Preparation of emulsions and particles by membrane emulsification for the food processing industry, Journal of Food Engineering, Volume 92, Issue 3, June 2009, Pages 241-249, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.11.017.
(http://www.sciencedirect.com/science/article/B6T8J-4V59VSD-1/2/3ae8606cc332604f759b35435787d045)
Abstract:
Emulsions play an important role in the formulation of foods for production of o/w emulsions, e.g., dressings, artificial milks, cream liqueurs, as well as for preparation of some w/o emulsions, e.g. margarines and low fat spreads. Over the last 20 years, there has been a growing interest in a technique for making emulsions known as 'membrane emulsification'. This method involves using a low pressure to force the dispersed phase to permeate through a membrane into the continuous phase. The distinguishing feature is that the resulting droplet size is controlled primarily by the choice of the membrane and not by the generation of turbulent droplet break-up. This article provides a review on the membrane emulsification process for the food processing industry: the main characteristics of the membrane emulsification process are summarized; and simple emulsions, multiple emulsions, and encapsulated materials prepared using membrane emulsification are described.
Keywords: Emulsion; Encapsulation; Food; Membrane emulsification; Multiple emulsion

Bing-Zheng Li, Li-Jun Wang, Dong Li, Bhesh Bhandari, Shu-Jun Li, Yubin Lan, Xiao Dong Chen, Zhi-Huai Mao, Fabrication of starch-based microparticles by an emulsification-crosslinking method, Journal of Food Engineering, Volume 92, Issue 3, June 2009, Pages 250-254, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.08.011.
(http://www.sciencedirect.com/science/article/B6T8J-4T7XGJK-4/2/71661f55d11edacf05fc708b25bf5333)
Abstract:
In this study, starch-based microparticles (MPs) fabricated by a water-in-water (w/w) emulsification-crosslinking method could be used as a controlled release delivery vehicle for food bioactives. Due to the processing route without the use of toxic organic solvents, it is expected that these microparticles can be used as delivery vehicles for controlled release of food bioactives.

Octenyl succinic anhydride (OSA) starch was used as raw material. Optical microscopy showed OSA starch-based microparticles (OSA-MPs) had a good dispersibility. Scanning electron microscopy (SEM) showed OSA-MPs had a solid structure and spherical shape. X-ray diffraction (XRD) patterns revealed that OSA-MPs were of amorphous structure. A Plackett-Burman screening design methodology was employed to evaluate the effects of the process and formulation parameters on the particle size of OSA-MPs. Considering the statistical analysis of the results, it appeared that the OSA starch concentration (P = 0.0146), poly(ethylene glycol) (PEG) molecular weight (P = 0.0155), volume ratio of dispersed phase/continuous phase (P = 0.0204) and PEG concentration (P = 0.0230) had significant effect on particle size.
Keywords: Starch-based microparticle; Water-in-water emulsification; Crosslinking; Plackett-Burman; Particle size

A. Fernandez Garcia, P. Butz, M. Corrales, R. Lindauer, P. Picouet, G. Rodrigo, B. Tauscher, A simple coloured indicator for monitoring ultra high pressure processing conditions, Journal of Food Engineering, Volume 92, Issue 4, June 2009, Pages 410-415, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.12.033.
(http://www.sciencedirect.com/science/article/B6T8J-4V9S2KX-1/2/9df14ac55ab1d3f7d5e91e3971c257ff)
Abstract:
Diels-Alder reactions between coenzyme Q(0) as dienophile and sorbic acid as diene compounds have been investigated under high pressure and temperature combinations. The reaction leads to a colour degradation of coenzyme Q(0), due to the formation of Diels-Alder adducts. The fact that this is a coloured reaction makes it suitable to be applied as indicator in high pressure treatments. The response to pressure and temperature was satisfactorily adjusted to a first order kinetic model in the pressure/temperature range where food safety and quality are crucial, as well as under conditions necessary to achieve ultra high pressure assisted thermal sterilization of foods. Furthermore, concentrations of both components could be systematically chosen to reveal the pressure and temperature achieved during the pressure assisted thermal sterilization processes. The proposed system is simple, coloured and based on non-toxic chemicals, and could thus become a useful tool for monitoring high pressure thermal processing conditions.
Keywords: Diels-Alder; Indicator; Integrator; Food processing; Ultra high pressure; Ubiquinone

C. Barrera, N. Betoret, P. Corell, P. Fito, Effect of osmotic dehydration on the stabilization of calcium-fortified apple slices (var. Granny Smith): Influence of operating variables on process kinetics and compositional changes, Journal of Food Engineering, Volume 92, Issue 4, June 2009, Pages 416-424, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.12.034.
(http://www.sciencedirect.com/science/article/B6T8J-4VB01P0-1/2/1daf274693d23a1629b7e134dc61ed66)
Abstract:
Commonly available calcium-fortified foods include non-structured and formulated foods. In contrast, vacuum impregnation allows the introduction of physiologically active compounds to vegetal tissues without disrupting their cellular structure, but inducing changes in their behaviour during further processing. In the particular case of osmotic dehydration of apple slices (var. Granny Smith) with a 55 Brix sucrose solution, both the water loss and the gain in soluble solids were observed to be affected by the amount of calcium incorporated into their porous structure by means of vacuum impregnation, the processing temperature and the addition of 1% of calcium lactate to the osmotic solution. To be precise, water removal was observed to decrease as the calcium content of the vacuum impregnated samples increased from 0% to 40% of the recommended daily allowances for adults in a 200 g sample. Overall, the addition of 1% calcium lactate to the osmotic solution decreased the constant rate of both water loss and gain in soluble solids, but resulted in a final product with an increased mineral content. However, an increase in

the temperature of the osmotic solution from 30 to 50 [degree sign]C was reported to promote faster water loss and soluble solids uptake, but to a different extent depending on the fortification level required for the processed samples. Despite the loss of part of the calcium incorporated to apple slices by means of vacuum impregnation, osmotic dehydration can be considered as a useful tool to increase the stability of this kind of product without seriously reducing its nutritional value.
Keywords: Functional foods; Calcium fortification; Vacuum impregnation; Osmotic dehydration

K. Khanah Mokwena, Juming Tang, C. Patrick Dunne, Tom C.S. Yang, Edgard Chow, Oxygen transmission of multilayer EVOH films after microwave sterilization, Journal of Food Engineering, Volume 92, Issue 3, June 2009, Pages 291-296, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.11.011.
(http://www.sciencedirect.com/science/article/B6T8J-4V42J22-1/2/e998a478e7ef95e704ba9c4bcad741a5)
Abstract:
Classical industrial retort sterilization processes expose food packages to high temperature, moisture, and pressure conditions. Migration of water into hydrophilic polymers such as ethylene vinyl alcohol (EVOH) sharply reduces their oxygen barrier ability. This research studied the effect of short time microwave sterilization on oxygen transmission rates (OTR) of two multilayer films containing EVOH and compared with that of conventional retorting. Film A had a laminated structure of EVOH sandwiched between oriented polyethylene terephthalate (PET) and cast polypropylene (PP). Film B consisted of PET laminated to a 7-layer co-extruded structure of PP/tie/Nylon 6/EVOH/Nylon 6/tie/PP. The films were used as lidstocks for trays containing mashed potato and processed by microwave or retort sterilization to achieve lethality of F0 = 3 min or F0 = 6 min. For both films the classical retort treatments resulted in higher OTR than the microwave treatments. In all cases, the oxygen barrier property of film A was better than that of film B. Storage of the food packages for 2 months at room temperature helped with recovery of more than 50% of the oxygen barrier lost by the films. The oxygen barrier slowly deteriorated beyond 2 months in storage. Over the 12 months storage, the OTR for both films after F0 = 3 min microwave process remained below 2 cc/m2 day, a value comparable to commercially available polyvinylidene chloride (PVDC) laminated films currently used in the USA as lid film for shelf-stable products.
Keywords: Oxygen transmission; Ethylene vinyl alcohol; Microwave processing; Retort; Package film

Callum F. Ross, Rhyan L. Washington, Alison Eckhardt, David A. Reed, Erin R. Vogel, Nathaniel J. Dominy, Zarin P. Machanda, Ecological consequences of scaling of chew cycle duration and daily feeding time in Primates, Journal of Human Evolution, Volume 56, Issue 6, June 2009, Pages 570-585, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2009.02.007.
(http://www.sciencedirect.com/science/article/B6WJS-4W9V7DK-2/2/b6e81afaea8da39ae0291d05fdf641d3)
Abstract:
Feeding systems and behaviors must evolve to satisfy the metabolic needs of organisms. This includes modifications to feeding systems as body size and metabolic needs change. Using our own data and data from the literature, we examine how size-related changes in metabolic needs are met by size-related changes in daily feeding time, chew cycle duration, volume of food processed per chew, and daily food volume intake in primates. Increases in chew cycle duration with body mass in haplorhine primates are described by a simple power function (cycle time [alpha] body mass0.181). Daily feeding time increases with body mass when analyzed using raw data from the 'tips' of the primate phylogenetic tree, but not when using phylogenetically independent contrasts. Whether or not daily feeding time remains constant or increases with body

mass, isometry of ingested bite size and the slow rate of increase in chew cycle time with body size combine to allow daily ingested food volume to scale faster than predicted by metabolic rate. This positive allometry of daily ingested food volume may compensate for negative allometry of nutrient concentration in primate foods. Food material properties such as toughness and hardness have little impact on scaling of chew cycle durations, sequence durations, or numbers of chews in a sequence. Size-related changes in food processing abilities appear to accommodate size-related changes in food material properties, and primates may alter ingested bite sizes in order to minimize the impacts of food material properties on temporal variables such as chew cycle duration and chew sequence duration.
Keywords: Mastication; Chewing; Ecology; Food material properties

Anna Jofre, Teresa Aymerich, Narcis Grebol, Margarita Garriga, Efficiency of high hydrostatic pressure at 600 MPa against food-borne microorganisms by challenge tests on convenience meat products, LWT - Food Science and Technology, Volume 42, Issue 5, June 2009, Pages 924-928, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.12.001.
(http://www.sciencedirect.com/science/article/B6WMV-4V47CNS-2/2/611091772e67b94a9f653e7ccfed0453)
Abstract:
The food-borne pathogens Listeria monocytogenes, Salmonella enterica, Staphylococcus aureus, Yersinia enterocolitica and Campylobacter jejuni, and the spoilage lactic acid bacteria (LAB), Escherichia coli and the yeast Debaryomyces hansenii were inoculated on slices of cooked ham, dry cured ham and marinated beef loin. During storage at 4 [degree sign]C, L. monocytogenes and LAB increased up to 3.5 log units while the other species, unable to grow under refrigeration, continued at the spiking level. The application of a 600 MPa treatment effectively inactivated most of the microorganisms, the counts of which, except for LAB that increased in cooked ham and in beef loin, progressively decreased or maintained below the detection limit during the whole storage (120 days at 4 [degree sign]C).
Keywords: Food-borne pathogens; High-pressure processing; Meat products; Safety; Shelf-life

T.B. Tribess, J.P. Hernandez-Uribe, M.G.C. Mendez-Montealvo, E.W. Menezes, L.A. Bello-Perez, C.C. Tadini, Thermal properties and resistant starch content of green banana flour (Musa cavendishii) produced at different drying conditions, LWT - Food Science and Technology, Volume 42, Issue 5, June 2009, Pages 1022-1025, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.12.017.
(http://www.sciencedirect.com/science/article/B6WMV-4VCNPC3-2/2/11e637cab4d5ea7d29cf571701eb9729)
Abstract:
The objective of this research was to verify the effect of drying conditions on thermal properties and resistant starch content of green banana flour (Musa cavendishii). The green banana flour is a complex-carbohydrates source, mainly of resistant starch, and quantifying its gelatinization is important to understand how it affects food processing and the functional properties of the flour. The green banana flour was obtained by drying unripe peeled bananas (first stage of ripening) in a dryer tunnel at 52 [degree sign]C, 55 [degree sign]C and 58 [degree sign]C and air velocity at 0.6 m s-1, 1.0 m s-1 and 1.4 m s-1. The results obtained from differential scanning calorimetry (DSC) curves show a single endothermic transition and a flow of maximum heating at peak temperatures from (67.95 +/- 0.31) [degree sign]C to (68.63 +/- 0.28) [degree sign]C. ANOVA shows that only drying temperature influenced significantly ($P < 0.05$) the gelatinization peak temperature (Tp). Gelatinization enthalpy ([Delta]H) varied from 9.04 J g-1 to 11.63 J g-1 and no significant difference was observed for either temperature or air velocity. The resistant starch content of the flour produced varied from (40.9 +/- 0.4) g/100 g to (58.5 +/- 5.4) g/100 g, on dry basis (d. b.), and was influenced by the combination of drying conditions: flour produced at 55 [degree sign]C/1.4 m s-1 and 55 [degree sign]C/1.0 m s-1 presented higher content of resistant starch.

Keywords: Green banana flour; Gelatinization; Resistant starch; DSC

L. Baert, J. Debevere, M. Uyttendaele, The efficacy of preservation methods to inactivate foodborne viruses, International Journal of Food Microbiology, Volume 131, Issues 2-3, 31 May 2009, Pages 83-94, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.03.007.
(http://www.sciencedirect.com/science/article/B6T7K-4VW54YC-2/2/8917c013f2f4b8203b3f60d670aaf249)
Abstract:
During the last decade an increased incidence of infections and outbreaks attributed to foodborne viruses, in particular noroviruses (NoV), was observed world wide. The awareness of the presence of viruses on food emphasized the need to acquire knowledge regarding the effect of preservation methods upon viruses. Most foodborne viruses cannot be cultured in the laboratory, which hinders studies of their stability in food. Cultivable surrogate viruses, genetically related to the human infecting strains, are taken as a substitute to define inactivation rates. The last years, the number of survival and inactivation studies using various surrogate viruses increased. In this review, state-of-the-art information regarding the efficacy of preservation methods to reduce the level of viruses on food is compiled. In the first place, the effect of preservation methods establishing microbial growth inhibition (chilling, freezing, acidification, reduced water activity and modified atmosphere packaging) upon foodborne viruses is described. Secondly, the use of preservation methods establishing microbial inactivation such as heat treatment, high hydrostatic pressure processing and irradiation to eliminate viruses is discussed. In the third place, the efficacy of decontamination methods on fresh produce and purification procedures applied on live bivalve shellfish to reduce the viral load is included. These studies indicate that viruses persist well on chilled, acidified, frozen foods and foods packed under modified atmosphere or in dried conditions. Intervention strategies inducing microbial inactivation are required to achieve a 3 log reduction of the level of viruses. Decontamination of fresh produce reduces viruses with a maximum of 1 to 2 log while purification of live bivalves is not adequate to prevent viral outbreaks. It was noted that the effect of a particular food preservation method is dependent upon the virus tested and type of food.
Keywords: Food preservation; Foodborne; Viruses; Inactivation; Reduction; Norovirus; Hepatitis A virus

Jette Kjeldgaard, Kirsten Jorgensen, Hanne Ingmer, Growth and survival at chiller temperatures of Arcobacter butzleri, International Journal of Food Microbiology, Volume 131, Issues 2-3, 31 May 2009, Pages 256-259, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.02.017.
(http://www.sciencedirect.com/science/article/B6T7K-4VPV57Y-1/2/74a0b0bc7db3bd48c415b0e00fa471da)
Keywords: Arcobacter butzleri; Chicken meat juice medium; Minimum temperature for growth; Survival at chiller temperature

T.W.R. Chia, R.M. Goulter, T. McMeekin, G.A. Dykes, N. Fegan, Attachment of different Salmonella serovars to materials commonly used in a poultry processing plant, Food Microbiology, In Press, Corrected Proof, Available online 29 May 2009, ISSN 0740-0020, DOI: 10.1016/j.fm.2009.05.012.
(http://www.sciencedirect.com/science/article/B6WFP-4WD7B59-3/2/ca48cde4ed2c0d59f5a51b45c0e22566)
Abstract:
Salmonella can adhere to poultry and food contact surfaces and persist to cause diseases. Adhesion of Salmonella Sofia (n = 14), S. Typhimurium (n = 6), S. Infantis (n = 3) and S. Virchow (n = 2) to Teflon(R), stainless steel, glass, rubber and polyurethane were assayed using epifluorescence microscopy. Surface free energies of bacteria and materials were calculated using contact angle values and interfacial free energy between isolates and materials determined.

Surface roughness of the materials was analysed using atomic force microscopy. S. Sofia isolates adhered in higher numbers ($P < 0.05$) to all materials compared to other serovars. The mean number of cells of S. Sofia isolates attaching to Teflon(R) were significantly higher ($P < 0.05$) compared to all materials except stainless steel ($P > 0.05$). Mean roughness values ranged from 82.26 nm (Teflon(R)) to 1.34 nm (glass). Correlations between the apolar component of the surface free energy of materials ([gamma]SLW) and bacterial adhesion (R2 = 0.80), and between [gamma]SLW and the surface roughness of the materials (R2 = 0.71) were found. Materials more positive in interfacial free energies had the highest number of adhering bacteria. Generalised surface property measurements were found to be useful in characterising Salmonella attachment but the degree of variability in results suggests that other factors, such as flagella or membrane proteins, could also contribute.
Keywords: Surface roughness; Physicochemical surface parameters; AFM; Salmonella; Attachment to materials; Interfacial free energy

Emmie Dornez, Kurt Gebruers, Jan A. Delcour, Christophe M. Courtin, Grain-associated xylanases: Occurrence, variability, and implications for cereal processing, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 23 May 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.05.004.
(http://www.sciencedirect.com/science/article/B6VHY-4WC113T-3/2/a5b47f34ff8dbc7a29c60ffa85de5a9b)
Abstract:
Xylanases (EC 3.2.1.8) hydrolyse the backbone of cereal cell wall arabinoxylans and often have a significant impact on cereal-based processes and end-products. The use of microbial xylanases as processing aids in this respect is well established and has been extensively studied. Much less research has focused on inherently present cereal-associated xylanases and their possible impact. Cereals produce xylanases for re-modeling and expansion of cereal cell walls during normal cell growth and for more drastic cell wall degradation during seed germination. Besides these endogenous xylanases, cereals also contain microbial xylanases from micro-organisms populating the outer grain kernels layers. Unfortunately, these microbial xylanases are often inhibited by wheat proteinaceous xylanase inhibitors and they hence escape standard xylanase activity measurements. It is more correct to refer to these activity levels as `apparent' xylanase activity levels. As a result, the occurrence of cereal-associated xylanases might have been largely underestimated in the past and hence unjustly been disregarded. The levels and the types of cereal-associated xylanases differ strongly between grain species, varieties, and tissues, and are largely affected by grain growing conditions. These variations in the levels of grain-associated xylanase activity affect several cereal-based food and feed applications. This paper provides an overview of the occurrence and variability of cereal-associated xylanases and of their potential impact on bread making, shelf life of refrigerated doughs, brewing, animal feed efficiency, pasta production, and wheat gluten-starch separation.

Audrey Dussutour, Stephen J. Simpson, Communal Nutrition in Ants, Current Biology, Volume 19, Issue 9, 12 May 2009, Pages 740-744, ISSN 0960-9822, DOI: 10.1016/j.cub.2009.03.015.
(http://www.sciencedirect.com/science/article/B6VRT-4W03P8D-6/2/02d17b25a1aecbde6a10dabae7b2923c)
Abstract: Summary
Studies on nonsocial insects have elucidated the regulatory strategies employed to meet nutritional demands [1], [2] and [3]. However, how social insects maintain the supply of an appropriate balance of nutrients at both a collective and an individual level remains unknown. Sociality complicates nutritional regulatory strategies [4], [5] and [6]. First, the food entering a colony is collected by a small number of workers, which need to adjust their harvesting strategy to the demands for nutrients among individuals within the colony [4], [5], [6] and [7]. Second, because

carbohydrates are used by the workers and proteins consumed by the larvae [7], [8], [9], [10], [11], [12], [13] and [14], nutritional feedbacks emanating from both must exist and be integrated to determine food exploitation by foragers [4], [5], [6], [15] and [16]. Here, we show that foraging ants can solve nutritional challenges for the colony by making intricate adjustments to their feeding behavior and nutrient processing, acting both as a collective mouth and gut. The amount and balance of nutrients collected and the precision of regulation depend on the presence of larvae in the colony. Ants improved the macronutrient balance of collected foods by extracting carbohydrates and ejecting proteins. Nevertheless, processing excess protein shortened life span--an effect that was greatly ameliorated in the presence of larvae.
Keywords: EVO_ECOL

Yolanda Aguilera, Maria A Martin-Cabrejas, Vanesa Benitez, Esperanza Molla, Francisco J Lopez-Andreu, Rosa M Esteban, Changes in carbohydrate fraction during dehydration process of common legumes, Journal of Food Composition and Analysis, In Press, Accepted Manuscript, Available online 4 May 2009, ISSN 0889-1575, DOI: 10.1016/j.jfca.2009.02.012.
(http://www.sciencedirect.com/science/article/B6WJH-4W6XVWY-2/2/97e83561a97178db884fb82bcd876c5b)
Abstract:
The effect of thermal dehydration on carbohydrate fraction of legumes (chickpea and two cultivars of beans) was evaluated. The legumes showed important contents of total dietary fibre (TDF), with insoluble dietary fibre (IDF) as the main fraction (75-96%). The level of dietary fiber (DF) in legumes was affected by processing; dehydration was the process that exhibited a significant increase in soluble dietary fibre (SDF). The extent of DF changes depended on the type of legume and the process. Starch was also affected by processing which improved its digestibility, although this depends on the type of legume and treatment (soaking, cooking and dehydration). Legumes exhibited important levels of raffinose family oligosaccharides (RFOs), but the profile differed according to the seed. The dehydration process produced significant reductions of these soluble compounds: 76% for white bean, 57% for chickpea and 41% for pink-mottled cream bean. Therefore, dehydration was an efficient process to reduce flatulence compounds, and legume flours can be proposed as functional ingredients for their beneficial health effects.
Keywords: Bean; Lentil; Grain legumes; Legume flour; Dietary fibre; Starch; [alpha]-galactosides; Dehydration; Food processing; Food analysis; Food composition

Wen-Tien Tsai, Mei-Kuei Lee, Jeng-Hung Chang, Ting-Yi Su, Yuan-Ming Chang, Characterization of bio-oil from induction-heating pyrolysis of food-processing sewage sludges using chromatographic analysis, Bioresource Technology, Volume 100, Issue 9, May 2009, Pages 2650-2654, ISSN 0960-8524, DOI: 10.1016/j.biortech.2008.11.023.
(http://www.sciencedirect.com/science/article/B6V24-4VBM49J-2/2/eb93ca4c50d041a629d270c80d1eca18)
Abstract:
In this study, gas chromatography-mass spectrometry (GC-MS) was used to analyze the pyrolytic bio-oils and gas fractions derived from the pyrolysis of industrial sewage sludges using induction-heating technique. The liquid products were obtained from the cryogenic condensation of the devolatilization fraction in a nitrogen atmosphere using a heating rate of 300 [degree sign]C/min ranging from 25 to 500 [degree sign]C. The analytical results showed that the pyrolysis bio-oils were very complex mixtures of organic compounds and contained a lot of nitrogenated and/or oxygenated compounds such as aliphatic hydrocarbons, phenols, pyridines, pyrroles, amines, ketones, and so on. These organic hydrocarbons containing nitrogen and/or oxygen should originate from the protein and nucleic acid textures of the microbial organisms present in the sewage sludge. The non-condensable devolatilization fractions were also composed of nitrogenated and oxygenated compounds, but contained small fractions of phenols, 1H-indoles,

and fatty carboxylic acids. On the other hand, the compositions in the non-condensable gas products were principally carbon dioxide, carbon monoxide and methane analyzed by gas chromatography-thermal conductivity detector (GC-TCD).
Keywords: Sewage sludge; Pyrolytic oil; Gas chromatography-mass spectrometry

C. Garcia-Sifuentes, R. Pacheco-Aguilar, M. Lugo-Sanchez, G. Garcia-Sanchez, J.C. Ramirez-Suarez, F. Garcia-Carreno, Properties of recovered solids from stick-water treated by centrifugation and pH shift, Food Chemistry, Volume 114, Issue 1, 1 May 2009, Pages 197-203, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.09.064.
(http://www.sciencedirect.com/science/article/B6T6R-4TJTXC6-1/2/8deee9e54a3974980c3ef4a119d7a24e)
Abstract:
Processing of sardine fishmeal generates pollution and waste with potentially useful protein. Sardine stick-water (SW) from fishmeal operation was submitted to a complementary centrifugation step followed by pH adjustment (acidic + alkaline) to recover solids for their compositional, functional and nutritional properties evaluation. Insoluble fractions (from acidic treatment (IF1) and alkaline treatment (IF2)) had a chemical composition of 76 +/- 4 and 16.9 +/- 3.1% protein, 12 +/- 6.2 and 2.9 +/- 1.9% fat, 7.9 +/- 2 and 75.4 +/- 2.6% ash, respectively. IF1 and IF2 were good sources of Ca++, Mg++, P3-, K+ and essential amino acids. IF2 was whiter than IF1 but less colour stable over time. Solubility of proteins from IF1 and IF2 was higher than that of commercially used materials such as egg albumin and sodium caseinate. IF1 chemical, nutritional and functional characteristics suggest its potential use as food/feed compositional ingredient.
Keywords: Stick-water; pH adjustment; Solids recovering

Valentina Stojceska, Paul Ainsworth, Andrew Plunkett, Senol Ibanoglu, The effect of extrusion cooking using different water feed rates on the quality of ready-to-eat snacks made from food by-products, Food Chemistry, Volume 114, Issue 1, 1 May 2009, Pages 226-232, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.09.043.
(http://www.sciencedirect.com/science/article/B6T6R-4THC1HM-4/2/965d9fc7aea6ae6737292aa928c92e99)
Abstract:
The effect of different levels of feed moisture (12-17%) during extrusion cooking, using a co-rotating twin-screw extruder on selected nutritional and physical properties of extruded products was investigated. Four different formulations were used based on wheat flour and corn starch with the addition of 10% brewer's spent grain (BSG) and red cabbage (RC) trimming reducing the flour and starch. The samples were: wheat flour + BSG (WBSG), corn starch + BSG (CBSG), wheat flour + red cabbage (WRC) and corn starch + red cabbage (CRC). Process conditions utilised were: constant feed rate of 25 kg/h, screw speed 200 rpm and barrel temperature of 80 and 120 [degree sign]C. The results indicated that increasing the water feed to 15% increased the level of total dietary fibre (TDF) in all the extrudates while extrusion processing increased the level of TDF in WBSG, CBSG and CRC but decreased in WRC products. Extrusion cooking increased the level of total antioxidant capacity (TAC) and total phenolic compounds (TPC) in WRC and CRC. In addition to water feed level affecting the TDF of the extrudates, also affected were the expansion ratio, bulk density, hardness, WSI, SME and colour. The protein level of the products and hardness of extrudates were related to the different formulations.
Keywords: Total dietary fibre; Antioxidants; Ready-to-eat snacks; Extrusion; Brewer's spent grain; Red cabbage trimmings

Molay Kumar Roy, Lekh Raj Juneja, Seiichiro Isobe, Tojiro Tsushida, Steam processed broccoli (Brassica oleracea) has higher antioxidant activity in chemical and cellular assay systems, Food

Chemistry, Volume 114, Issue 1, 1 May 2009, Pages 263-269, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.09.050.
(http://www.sciencedirect.com/science/article/B6T6R-4TJ1HS3-4/2/2769e1c111bea14bfd78ab6b8c17ad6e)
Abstract:
Thermally processed fruits and vegetables have long been considered to have a lower nutritional value compared with the fresh produce. This consideration is based on the fact that vitamin C or other thermolabile compounds may lose their activity due to oxidation or in consequences of leaching into the water during home cooking or industrial processing, such as blanching. In this study, broccoli, one of the major agricultural products was exposed to steam; and total antioxidant activity was measured by oxygen radical capacity (ORAC) analysis and a cellular measure of reactive oxygen species (ROS) assay. The study also evaluated the level of total phenolics and total flavonoid content in fresh and steam processed broccoli samples. The result clearly showed that steam-processing elevated the total ORAC (hydrophilic, lipophilic) value by 2.3 fold. Measuring cellular levels of ROS, we found that the hydrophilic part of a steam processed broccoli had a significant reduction of 2,2'-azobis [2-amidinopropane] dihydrochloride (AAPH) induced intracellular ROS level in comparison to that of fresh counterpart. Total phenolic content and total flavonoid content also increased in steamed-processed broccoli. Chromatographic analysis showed that a non-phenolic fraction which appeared unbound on a cosmosil 140 C18 resin contributed 54%, and the phenolic pool eluted by 50-80% methanol contributed 41% of its total increase in ORAC value. Steam processed broccoli gave significant cytoprotection in PC-12 cell line and this neuroprotective efficacy warrant further investigation. This information may have a significant impact on consumers' food selection, depending on the processing technology used to process agricultural products.
Keywords: Broccoli; Steam process; Blanching; Antioxidant capacity; ORAC; DCFH-DA; PC-12 cells

Paola Zunin, Paola Salvadeo, Raffaella Boggia, Silvia Lanteri, Study of different kinds of 'Pesto Genovese' by the analysis of their volatile fraction and chemometric methods, Food Chemistry, Volume 114, Issue 1, 1 May 2009, Pages 306-309, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.09.012.
(http://www.sciencedirect.com/science/article/B6T6R-4TD4J0W-5/2/2f60f3e743c4ce088ea1b3ff3d69473d)
Abstract:
The volatile fraction of different kinds of Pesto genovese, a typical Italian basil-based pasta sauce, was analysed by Headspace Sorptive Extraction (HSSE)-Gas Chromatography-Mass Spectrometry (GC-MS) coupled with chemometric methods. Three kinds of commercial samples were considered: (a) non heat-processed shop manufactured, (b) heat-processed industrial and (c) non heat-processed industrial samples. The category of heat-processed samples was easily discriminated by the amounts of the terpene hydrocarbon [alpha]-terpinene. In order to distinguish the three categories, multivariate statistical analysis was then performed. Good prediction results were obtained by the combination of Linear Discriminant Analysis (LDA) and Stepwise LDA (STEPLDA): the percentage of correct predictions was 92 for food industry manufactured non heat-processed samples and 100 both for shop manufactured, non heat-processed samples, and for food industry manufactured, heat-processed samples.
Keywords: Pesto Genovese; Pasta sauce; Heat-processing; Volatile fraction; Principal component analysis; Linear discriminant analysis

Monique H. Vingerhoeds, Erika Silletti, Jolan de Groot, Raymond G. Schipper, George A. van Aken, Relating the effect of saliva-induced emulsion flocculation on rheological properties and

retention on the tongue surface with sensory perception, Food Hydrocolloids, Volume 23, Issue 3, May 2009, Pages 773-785, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2008.04.014.
(http://www.sciencedirect.com/science/article/B6VP9-4SM62KS-1/2/cd0f1d62164b5cd9971d3b6323e6d12e)
Abstract:
Perception of food emulsions can often not be directly related to the structure of the products before consumption. Taking into account the changing product structure upon oral processing might increase understanding of the relation between perception and product properties.
This study aims to gain insight in the effect of saliva-induced flocculation on perception of emulsions at neutral pH. Whey protein (WPI)-stabilized emulsions flocculating in a reversible manner with saliva were compared with lysozyme-stabilized emulsions that irreversible flocculate with saliva. The main emulsion variables, besides the emulsifying protein, were oil content (2.5% oil vs 10% oil), and the effect of emulsion thickening with guar gum (at 10% oil). To relate perception to processes occurring in the oral cavity, the emulsions were characterized before and after oral processing with respect to morphology and rheological properties (viscosity, storage and loss moduli). In addition, insight in retention of emulsion droplets on the tongue surface was obtained by measuring emulsifier and oil content in tongue swabs.
Saliva-induced emulsion flocculation clearly shows a large effect on perception of the here studied emulsions. WPI-stabilized emulsions showed little retention on the tongue surface and perception was characterized by creaminess, fattiness and thickness. Guar gum thickening further increased perception of these attributes. On the other hand, for lysozyme-stabilized emulsions perception was largely related to attributes like dryness, roughness and astringency. In addition, a large viscosity increase upon oral processing and clear retention of emulsion droplets on the tongue surface was observed. Guar gum thickening decreased the effects of irreversible flocculation, likely because of its lubricating properties and increased viscosity. Although the amount of mucins recovered from the tongue surface was unaffected by orally processing of lysozyme-stabilized emulsions, the sensory characteristics of these emulsions reminds one of astringency perception of e.g. tannins that precipitate salivary proteins.
Keywords: Emulsion flocculation; Perception; Lysozyme; Whey protein; Astringency

Saeed Akhtar, Daniel Paredes-Sabja, J. Antonio Torres, Mahfuzur R. Sarker, Strategy to inactivate Clostridium perfringens spores in meat products, Food Microbiology, Volume 26, Issue 3, May 2009, Pages 272-277, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.12.011.
(http://www.sciencedirect.com/science/article/B6WFP-4VB01SN-3/2/67b401226e414d64b83b584c554465b7)
Abstract:
The current study aimed to develop an inactivation strategy for Clostridium perfringens spores in meat through a combination of spore activation at low pressure (100-200 MPa, 7 min) and elevated temperature (80 [degree sign]C, 10 min); spore germination at high temperatures (55, 60 or 65 [degree sign]C); and inactivation of germinated spores with elevated temperatures (80 and 90 [degree sign]C, 10 and 20 min) and high pressure (586 MPa, at 23 and 73 [degree sign]C, 10 min). Low pressures (100-200 MPa) were insufficient to efficiently activate C. perfringens spores for germination. However, C. perfringens spores were efficiently activated with elevated temperature (80 [degree sign]C, 10 min), and germinated at temperatures lethal for vegetative cells (>=55 [degree sign]C) when incubated for 60 min with a mixture of l-asparagine and KCl (AK) in phosphate buffer (pH 7) and in poultry meat. Inactivation of spores (~4 decimal reduction) in meat by elevated temperatures (80-90 [degree sign]C for 20 min) required a long germination period (55 [degree sign]C for 60 min). However, similar inactivation level was reached with shorter germination period (55 [degree sign]C for 15 min) when spore contaminated-meat was treated with pressure-assisted thermal processing (568 MPa, 73 [degree sign]C, 10 min). Therefore, the most efficient strategy to inactivate C. perfringens spores in poultry meat containing 50 mM AK

consisted: (i) a primary heat treatment (80 [degree sign]C, 10 min) to pasteurize and denature the meat proteins and to activate C. perfringens spores for germination; (ii) cooling of the product to 55 [degree sign]C in about 20 min and further incubation at 55 [degree sign]C for about 15 min for spore germination; and (iii) inactivation of germinated spores by pressure-assisted thermal processing (586 MPa at 73 [degree sign]C for 10 min). Collectively, this study demonstrates the feasibility of an alternative and novel strategy to inactivate C. perfringens spores in meat products formulated with germinants specific for C. perfringens.
Keywords: C. perfringens; Food poisoning; Spore germination; Spore inactivation; High pressure processing

Zofia Lisiewska, Piotr Gebczynski, Emilia Bernas, Waldemar Kmiecik, Retention of mineral constituents in frozen leafy vegetables prepared for consumption, Journal of Food Composition and Analysis, Volume 22, Issue 3, May 2009, Pages 218-223, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.11.015.
(http://www.sciencedirect.com/science/article/B6WJH-4VFC7XB-1/2/9070d9eccc3a4d688cadd2af1cee1dda)
Abstract:
The content of ash, P, K, Ca, Mg, Na, Fe, Zn, Mn, Cu, Cr and Ni was compared in kale, spinach and New Zealand spinach: fresh, frozen and prepared for consumption. The investigation covered composition of the raw vegetables; the vegetables blanched in water before freezing (the traditional method of freezing); the vegetables cooked in brine (the modified method of freezing); and frozen products after 12 months of refrigerated storage. These products were prepared for consumption: either by cooking the products obtained by the traditional method in brine; or by defrosting and heating frozen vegetables obtained by modified method to consumption temperature in a microwave oven. The smallest losses caused by blanching were usually found in spinach and the highest in kale. Changes caused by cooking did not always exceed those noted after blanching. When compared with the raw vegetables, frozen products prepared for consumption contained significantly less potassium, magnesium and - with the exception of New Zealand spinach - phosphorus and copper. There was also a decrease in calcium, but only in kale; and in chromium and nickel, but only in New Zealand spinach. With regard to the remaining elements there was no consistent pattern. In products obtained by the modified method, the content of analysed constituents was greater in almost every case compared with that obtained using the traditional method; however, not all the differences were statistically significant.
Keywords: Leafy vegetables; Spinach; Kale; New Zealand spinach; Mineral composition; Pre-treatment; Freezing; Preparing for consumption; Nutrient retention after processing; Food quality; Food analysis; Food composition

Mahinda Senevirathne, You-Jin Jeon, Jin-Hwan Ha, Soo-Hyun Kim, Effective drying of citrus by-product by high speed drying: A novel drying technique and their antioxidant activity, Journal of Food Engineering, Volume 92, Issue 2, May 2009, Pages 157-163, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.10.033.
(http://www.sciencedirect.com/science/article/B6T8J-4TW10BY-5/2/91bccf4de21a71e6ffa691f4d9e239d7)
Abstract:
The citrus by-products (CBP) released from the citrus processing plants may contain high amount of potential bioactive compounds. Hence, this study aims to evaluate the antioxidant activity of CBP prepared using a novel drying technique known as high speed drying (HSD), economically and efficiently. HSD extract showed high amount of polymethoxylated flavones (heptamethoxyflavone and nobiletin) and flavanone (hesperidin and naritutin). The antioxidant activity was evaluated by means of DPPH, hydroxyl and alkyl radical scavenging assays and lipid peroxidation assay. HSD extract showed strong activities on radical scavenging (IC50 value of

DPPH, hydroxyl and alkyl radicals scavenging were 0.16, 0.5, 0.019 mg/mL, respectively) and lipid peroxidation inhibition. These results suggest that the flavonoids and other phenolic compounds in the HSD extract could be good radical scavengers. Hence, HSD method is an effective and efficient method to transform citrus by-products into dried form and could be used in food and pharmaceutical industry as a natural antioxidant agent.
Keywords: Citrus by-product; High speed drying; Polymethoxylated flavone; Flavanone; Antioxidant activity

Elena Gonzalez-Molina, Diego A. Moreno, Cristina Garcia-Viguera, Comparison of `Verna' lemon juice quality for new ingredients and food products, Scientia Horticulturae, Volume 120, Issue 3, 1 May 2009, Pages 353-359, ISSN 0304-4238, DOI: 10.1016/j.scienta.2008.11.010.
(http://www.sciencedirect.com/science/article/B6TC3-4V5NT33-2/2/c24dab187e9cf11a964cdcacb32a51a5)
Abstract:
Two clonal selections of lemon trees (`Verna-62' and `Verna-50-2'), were studied in aiming to ascertain the influence of genetic (clone) and environmental (season) factors on the human-health bioactive compounds of the lemon juice (vitamin C and flavonoids) and the possible relationship between composition and in vitro antioxidant capacity (DPPH, ABTS and FRAP) of the juice. The average values determined in bioactives were 13-26 mg[middle dot]100 mL-1 in total of analysed phenolics and 23-29 mg[middle dot]100 mL-1 in vitamin C content. Variability in the weather conditions and internal physiological phenomena of the fruits such as biosynthesis and transport, could determine, at least in part, differences in the contents of lemon juice bioactives more importantly than the genetic background, providing the food industry with phytochemically rich and nutritive lemons for processing and functional ingredients.
Keywords: Lemon juice; Citrus; Flavonoids; Vitamin C; Antioxidant; Season

Mohammad Alothman, Rajeev Bhat, A.A. Karim, Effects of radiation processing on phytochemicals and antioxidants in plant produce, Trends in Food Science & Technology, Volume 20, Issue 5, May 2009, Pages 201-212, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.02.003.
(http://www.sciencedirect.com/science/article/B6VHY-4VS404H-1/2/60490c0b64c78498905bb0d155d20844)
Abstract:
Consumption of natural, fresh plant produce rich in phytochemicals and antioxidants has been reported to overcome some of the degenerative diseases that affect humans. However, improper processing, handling, and long-term storage of produce might result in minimal availability of the health-promoting compounds. Food irradiation as a physical method for preservation has proved its efficacy over other common means of preservation, and is known to retain the quality of food and agricultural commodities. This paper summarizes the effects of ionizing (gamma and electron beam) and non-ionizing (UV) radiation on the compositional changes induced in health-promoting phytochemicals and antioxidants of plant origin. The information will be beneficial for further commercialization and exploration of this novel technology on a pilot scale in food industries.

Stefanie Bail, Sabine Krist, Eliot Masters, Heidrun Unterweger, Gerhard Buchbauer, Volatile compounds of shea butter samples made under different production conditions in western, central and eastern Africa, Journal of Food Composition and Analysis, In Press, Accepted Manuscript, Available online 22 April 2009, ISSN 0889-1575, DOI: 10.1016/j.jfca.2009.02.011.
(http://www.sciencedirect.com/science/article/B6WJH-4W4CWKP-1/2/3edea9913baeffd0e1cf03d4acd52f09)
Abstract:
African shea butter, a vegetable fat produced from the seeds of Vitellaria paradoxa C.F. Gaertn. (syn. Butyrospermum parkii L.), Sapotaceae, is a unique natural product of African countries of

great nutritional and commercial significance. The volatile compounds of various shea butter samples were analysed to investigate the influence of differences in manufacturing (boiling/roasting or combined procedures) on the headspace composition and with regard to the different origin of the samples. Volatile compounds were analysed by using gas chromatography-mass spectrometry after headspace solid phase microextraction (HS-SPME). Qualitative and semi-quantitative patterns of volatile compounds investigated in this study were composed of fatty acids degradation products e.g. acetic and hexanoic acid, carbonyl compounds (hexanal, heptanal, trans-2-heptenal, 2,4-heptadienal), 2-pentylfurane, processing compounds like furfural as well as glycerol and residue compounds from technical processing steps including milling. Comparison of the volatile profile of 16 different shea butters from four African countries showed that processing steps including drying of kernels before producing the fat and additional roasting procedures influence shea butter headspace composition significantly.
Keywords: African shea butter; Vitellaria paradoxa; Butyrospermum parkii; Volatile compounds; HS-SPME-GC-MS; Production methods; Regional varieties; Food composition; Food analysis

Gunter G.C. Kuhnle, Caterina Dell'Aquila, Shirley A. Runswick, Sheila A. Bingham, Variability of phytoestrogen content in foods from different sources, Food Chemistry, Volume 113, Issue 4, 15 April 2009, Pages 1184-1187, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.08.004.
(http://www.sciencedirect.com/science/article/B6T6R-4T5TPSB-D/2/290db4d2190590e6e52a3e6a718da70b)
Abstract:
Phytoestrogens are a group of non-steroidal polyphenolic plant metabolites and can mimic or modulate the action of endogenous estrogens. Phytoestrogens are considered to be beneficial for a variety of conditions, for example hormone-related cancers like breast and prostate cancer; however, epidemiological data are inconclusive and more information on exposure is required. To assess the exposure of larger cohorts or the general public, reliable data on the phytoestrogen content of food is necessary, however, this is made difficult by the variability of phytoestrogen content depending on variety, environmental factors, growth, harvesting and processing. Only limited data is available and most investigations have been conducted on soya beans in which a fourfold variation has been found. We have analysed nine different types of foods from different sources and countries of origin for their phytoestrogen content. The average detected range of phytoestrogen content between samples was threefold (95% confidence interval: 2.4; 3.4) with an average CV for isoflavones of 37% and lignans of 33%.
Keywords: Phytoestrogens; Variability; LC/MS; Food analysis

Lisia Senger Huber, Rosemary Hoffmann-Ribani, Delia B. Rodriguez-Amaya, Quantitative variation in Brazilian vegetable sources of flavonols and flavones, Food Chemistry, Volume 113, Issue 4, 15 April 2009, Pages 1278-1282, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.08.030.
(http://www.sciencedirect.com/science/article/B6T6R-4T72X25-2/2/338972a9c90e87244fe098b81c779311)
Abstract:
Reliable data on the levels of flavonoids in foods are necessary to identify sources and establish better the association between consumption and incidence of diseases. The objective of this work was to determine the flavonols and flavones of major vegetable sources in Brazil, compare with data obtained in different countries and evaluate possible seasonal and processing effects. Quercetin was the most widely distributed flavonol in the vegetables analysed, onions, kale and rucula being the richest sources. Kaempferol had the highest level in rucula. Apigenin was found only in parsley, at high concentration. The flavonoid contents tended to be higher in the summer, but the difference was statistically significant only for quercetin in curly lettuce and kale. Dehydrated onion had widely varying within-brand and between-brand quercetin contents,

indicating lack of quality control in the processing plants. Dehydrated parsley, on the other hand, did not have significant difference in the apigenin content among four brands.
Keywords: Flavonols; Flavones; Vegetables; Seasonal effects; Processing effects

Andrew P. Breksa III, Klaus Dragull, Development and validation of a decigram-scale method for the separation of limonin from limonin glucoside by C-18 flash chromatography, Food Chemistry, Volume 113, Issue 4, 15 April 2009, Pages 1308-1313, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.08.046.
(http://www.sciencedirect.com/science/article/B6T6R-4T9CD0B-3/2/3fefdcd7bdcc2559754563268bec3311)
Abstract:
A preparative method for decigram-scale polishing of limonin glucoside (1) with regard to removing traces of limonin (2), the main bitter principle in Citrus, is reported. During the method development and up-scaling stages, sample purity, sample size, solvent amounts, and drying conditions were varied. The resulting polishing method consists of a simple step gradient that utilises food grade solvents, ethanol and water at 15% EtOH and 50% EtOH steps. Using a 75 x 300 mm C-18 column, this method is capable of processing 20 g of material per run in less than 3 h. Recovery of the purified limonin glucoside following evaporation of the solvent was 93.5% (+/- 2.8, n = 6) and the limonin concentrations in the resulting materials were found to be reduced 10- to 15-fold.
Keywords: Citrus; Limonin; Limonin glucoside; Limonoids; Flash chromatography; ELS Detector

Petros A. Maragkoudakis, Konstantinos C. Mountzouris, Dimitris Psyrras, Silvia Cremonese, Jana Fischer, Mette D. Cantor, Effie Tsakalidou, Functional properties of novel protective lactic acid bacteria and application in raw chicken meat against Listeria monocytogenes and Salmonella enteritidis, International Journal of Food Microbiology, Volume 130, Issue 3, 15 April 2009, Pages 219-226, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.01.027.
(http://www.sciencedirect.com/science/article/B6T7K-4VH89YX-1/2/e69ac7fddc186e2115e13354865eae7e)
Abstract:
In this study 635 lactic acid bacteria of food origin were evaluated for their potential application as protective cultures in foods. A stepwise selection method was used to obtain the most appropriate strains for application as protective cultures in chicken meat. Specifically, all strains were examined for antimicrobial activity against various Gram positive and Gram negative pathogenic and spoilage bacteria. Strains exhibiting anti-bacterial activity were subsequently examined for survival in simulated food processing and gastrointestinal tract conditions, such as high temperatures, low pH, starvation and the presence of NaCl and bile salts. Selected strains where then examined for basic safety properties such as antibiotic resistance and haemolytic potential, while their antimicrobial activity was further investigated by PCR screening for possession of known bacteriocin genes. Two chosen strains were then applied on raw chicken meat to evaluate their protective ability against two common food pathogens, Listeria monocytogenes and Salmonella enteritidis, but also to identify potential spoilage effects by the application of the protective cultures on the food matrix. Antimicrobial activity in vitro was evident against Gram positive indicators, mainly Listeria and Brochothrix spp., while no antibacterial activity was obtained against any of the Gram negative bacteria tested. The antimicrobial activity was of a proteinaceous nature while strains with anti-listerial activity were found to possess one or more bacteriocin genes, mainly enterocins. Strains generally exhibited sensitivity to pH 2.0, but good survival at 45 [degree sign]C, in the presence of bile salts and NaCl as well as during starvation, while variable survival rates were obtained at 55 [degree sign]C. None of the strains was found to be haemolytic while variable antibiotic resistance profiles were obtained. Finally, when the selected strains Enterococcus faecium PCD71 and Lactobacillus fermentum ACA-DC179 were

applied as protective cultures in chicken meat against L. monocytogenes and S. enteritidis respectively, a significantly reduced growth of these pathogenic bacteria was observed. In addition, these two strains did not appear to have any detrimental effect on biochemical parameters related to spoilage of the chicken meat.
Keywords: Lactic acid bacteria; Protective; Antimicrobial; Chicken; Salmonella; Listeria

Mohamed A. Karmali, Victor Gannon, Jan M. Sargeant, Verocytotoxin-producing Escherichia coli (VTEC), Veterinary Microbiology, In Press, Corrected Proof, Available online 10 April 2009, ISSN 0378-1135, DOI: 10.1016/j.vetmic.2009.04.011.
(http://www.sciencedirect.com/science/article/B6TD6-4W1SRPG-4/2/17a75b30dbfb4ecae514e194740206d7)
Abstract:
Escherichia coli O157:H7 and other Verocytotoxin-producing E. coli (VTEC) are zoonotic pathogens associated with food and waterborne illness around the world. E. coli O157:H7 has been implicated in large outbreaks as well as in sporadic cases of haemorrhagic colitis and the sometimes fatal haemolytic uremic syndrome. VTs produced by these bacteria are thought to damage host endothelial cells in small vessels of the intestine, kidney and brain resulting in thrombotic microangiopathy. All VTs have the same subunit structure, glycolipid cell receptor and inhibit protein synthesis. During VTEC infection, it is thought one or more bacterial adhesins initiates colonization and establishes intimate attachment and is responsible for the translocation of a variety of effectors which alter the structure and function of host cells. VTEC are widespread in animals but ruminants are thought to be their natural reservoir. E. coli O157:H7 colonizes the terminal colon of cattle and can be shed in very large numbers by specific herdmates known as 'supershedders'. Faeces containing these organisms act as a source of contamination for a variety of foods and the environment. Many VTEC control efforts have been investigated along the 'farm to fork' continuum including, vaccination of cattle with colonization factors, and the use of novel antimicrobials, such as bacteriocins, chloral hydrate, bacteriophage and substances which disrupt quorum sensing. In addition, many barriers have been developed for use in the slaughter and food processing industry such as steam pasteurization and irradiation. Despite these efforts many scientific, technical and regulatory challenges remain in the control and prevention of VTEC-associated human illness.
Keywords: VTEC; Verocytotoxin-producing Escherichia coli; Shiga toxin-producing Escherichia coli; STEC; Zoonosis

Louis M. Nwokocha, Ndubisi A. Aviara, Chandra Senan, Peter A. Williams, A comparative study of some properties of cassava (Manihot esculenta, Crantz) and cocoyam (Colocasia esculenta, Linn) starches, Carbohydrate Polymers, Volume 76, Issue 3, 9 April 2009, Pages 362-367, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2008.10.034.
(http://www.sciencedirect.com/science/article/B6TFD-4TX794M-1/2/f5722d5e453f10a3b1f717366f63201c)
Abstract:
Some properties of cassava and cocoyam starches were studied and compared with a view to determining the functional applications in food systems for which they are suitable. The starches were compared in terms of their microscopic, thermal, physicochemical and rheological properties. Microscopy revealed smaller granule sizes of cocoyam starch compared with cassava. The amylose content was higher in cocoyam starch (33.3%) than in cassava starch (29.3%). Gelatinization in cassava starch occurred at a lower temperature range (60.11-72.67 [degree sign]C) compared with cocoyam (72.96-80.25 [degree sign]C) with the endothermic gelatinization enthalpy higher in cocoyam. The swelling power and solubility patterns indicated lower relaxation temperature, higher swelling and solubilization rates in cassava starch compared with cocoyam starch. The pasting characteristics of 8% (db, dry basis) starch slurry showed that cassava had

higher peak viscosity but lower stability and setback ratios compared with cocoyam. This indicates that cocoyam starch paste is better in withstanding processing conditions and would present a superior thickening characteristic than cassava starch paste. The flow properties of both starch pastes showed non-Newtonian behaviour and could be best described by the Herschel-Bulkley model. The rate index and yield stress of cocoyam starch paste was higher than that of cassava. The storage modulus of cocoyam starch paste was higher than that of cassava indicating that cocoyam starch paste was more rigid than cassava starch paste. Cassava starch paste exhibited higher paste clarity and freeze-thaw stability than cocoyam starch paste. The properties of cassava and cocoyam starches dictate their food applications.
Keywords: Cassava; Cocoyam; Starch; Pasting properties; Rheological properties; Paste clarity; Freeze-thaw stability

Luis Guerrero, Maria Dolors Guardia, Joan Xicola, Wim Verbeke, Filiep Vanhonacker, Sylwia Zakowska-Biemans, Marta Sajdakowska, Claire Sulmont-Rosse, Sylvie Issanchou, Michele Contel, M. Luisa Scalvedi, Britt Signe Granli, Margrethe Hersleth, Consumer-driven definition of traditional food products and innovation in traditional foods. A qualitative cross-cultural study, Appetite, Volume 52, Issue 2, April 2009, Pages 345-354, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.11.008.
(http://www.sciencedirect.com/science/article/B6WB2-4V0TCX5-1/2/167d1bd69b473a642d5d4044eb0fcd44)
Abstract:
Traditional food products (TFP) are an important part of European culture, identity, and heritage. In order to maintain and expand the market share of TFP, further improvement in safety, health, or convenience is needed by means of different innovations. The aim of this study was to obtain a consumer-driven definition for the concept of TFP and innovation and to compare these across six European countries (Belgium, France, Italy, Norway, Poland and Spain) by means of semantic and textual statistical analyses. Twelve focus groups were performed, two per country, under similar conditions. The transcriptions obtained were submitted to an ordinary semantic analysis and to a textual statistical analysis using the software ALCESTE. Four main dimensions were identified for the concept of TFP: habit-natural, origin-locality, processing-elaboration and sensory properties. Five dimensions emerged around the concept of innovation: novelty-change, variety, processing-technology, origin-ethnicity and convenience. TFP were similarly perceived in the countries analysed, while some differences were detected for the concept of innovation. Semantic and statistical analyses of the focus groups led to similar results for both concepts. In some cases and according to the consumers' point of view the application of innovations may damage the traditional character of TFP.
Keywords: Traditional food products; Innovation in traditional food products; Cross-cultural comparison; Focus group; Textual statistical analysis

Helen Coulthard, Jackie Blissett, Fruit and vegetable consumption in children and their mothers. Moderating effects of child sensory sensitivity, Appetite, Volume 52, Issue 2, April 2009, Pages 410-415, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.11.015.
(http://www.sciencedirect.com/science/article/B6WB2-4V34D2B-1/2/35a0550727689bb96b0e054e3331ebb1)
Abstract:
A cross-sectional study was carried out to ascertain the relative contribution of food neophobia and taste sensitivity to the amount of fruit and vegetables consumed in a typical day by 73, 2-5-year-old children attending nurseries in the South Birmingham area, UK. Sensory processing, parental control, child food neophobia and fruit and vegetable (FV) consumption of both mothers and children were measured. Parental and child FV consumption in the sample were positively associated ($p < 0.001$). Moderated regression analyses showed that taste/smell sensitivity, but not

food neophobia or tactile sensitivity, moderated the relationship between maternal and child FV consumption. In particular, children who were sensitive to taste/smell stimuli ate fewer fruit and vegetables, regardless of their mothers FV consumption. This finding implies that those children, who are sensitive to taste/smell stimuli, may be less likely to model maternal FV consumption. For these children, a more gradual route to encouraging acceptance, with attention to small sensory changes in foods, may be necessary to increase FV consumption.
Keywords: Fruit and vegetable consumption; Food neophobia; Sensory sensitivity; Parental control

Kevin Tansey, Ian Chambers, Andrew Anstee, Anthony Denniss, Alistair Lamb, Object-oriented classification of very high resolution airborne imagery for the extraction of hedgerows and field margin cover in agricultural areas, Applied Geography, Volume 29, Issue 2, April 2009, Pages 145-157, ISSN 0143-6228, DOI: 10.1016/j.apgeog.2008.08.004.
(http://www.sciencedirect.com/science/article/B6V7K-4TMHKVV-1/2/adacea11ef514354ab9af571e62207c2)
Abstract:
The recent advancement in technology for the airborne collection and subsequent processing and analysis of digital remotely sensed data has been significant. An investigation into the contributions that recent developments have made to the assessment and extraction of hedgerow and field margins is presented. Research into the active legislation by which hedgerows and agricultural biodiversity in England are bound is brought together in the concept of an ideal classification. Using Leica Geosystems ADS40 data, collected for Berkshire (UK), the degree to which the ideal classification can be reached is investigated, focusing on the extraction of hedgerows and unploughed field margin protective boundary strips as image objects. Elevation data were derived from the ADS40 imagery data to accompany true-colour and colour-infrared spectral information. By buffering the detected hedgerow objects in a GIS, we facilitated an investigation of the presence of measures that satisfy the minimum hedgerow protection requirements stipulated by the UK Department for Environment, Food and Rural Affairs (DEFRA). In our study area, it was estimated that 68% of areas that need to be classified as `grassy hedgerow boundary strip' to satisfy the minimum requirements of the legislation were established with low-lying grassy cover before the introduction of the legislation in July 2005. The implications of this research for the development of automated classification methods for field scale agricultural mapping are discussed.
Keywords: Very high resolution; Object-oriented classification; Hedgerows; Agriculture

Armando Alvis, Carlos Velez, Maite Rada-Mendoza, Mar Villamiel, Hector S. Villada, Heat transfer coefficient during deep-fat frying, Food Control, Volume 20, Issue 4, April 2009, Pages 321-325, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.05.016.
(http://www.sciencedirect.com/science/article/B6T6S-4SNGM3C-1/2/928f8236ad7b6d61767c1682c9a4a108)
Abstract:
The heat transfer coefficient is significant in the design of equipment and processes which must be carefully evaluated and used. For example, the coefficient value defines to a great extent the equipment size and also establishes the contacts between phases and processing time. The value of the heat coefficient is traditionally obtained by calculation or experimentation. It is the average of the precise coefficients throughout equipment. The evaluation of the heat transfer coefficient by calculation involves a dimensional relationship obtained by geometry and determined thermal and flow conditions. Sometimes, these have been determined originally by mass transfer and others by heat transfer.
The heat transfer coefficient during frying is relevant in the modeling and calculation of the fryer systems of foods. The methods found in the literature to measure the heat transfer coefficient during deep-fat frying have some limitations such as the lack of standard techniques. The mass

transfer neither the packing effects are not considered. To our knowledge, few studies, if any, on the heat transfer coefficient based on the position of the material are available. The present paper has been devoted to explore the main effects of deep-fat frying on fried material and to review the most important methods used to measure the convective heat transfer coefficient.
Keywords: Heat transfer coefficient; Frying; Immersion

Stephanie Marty, Keneth W. Baker, Alejandro G. Marangoni, Optimization of a scanner imaging technique to accurately study oil migration kinetics, Food Research International, Volume 42, Issue 3, April 2009, Pages 368-373, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.12.017.
(http://www.sciencedirect.com/science/article/B6T6V-4V9S37X-1/2/646e80a6c037a457d7f8cd39bb93f8c0)
Abstract:
The aim of this study was to refine an image analysis technique that was developed in our laboratory in order to study oil migration in confectionery products (Marty, S., Baker, K., Dibildox-Alvarado, E., Neves Rodrigues, J., & Marangoni, A. G. (2005). Monitoring and quantifying of oil migration in cocoa butter using a flatbed scanner and fluorescence light microscopy. Food Research International). The migration of a nile red stained oily phase (soft fat) was monitored in tempered cocoa butter matrices kept at 18 [degree sign]C for about 75 days. Oil migration kinetics was quantified using a common flatbed scanner followed by image processing and analysis. The most reliable parameter derived from this analysis is the position of the dye front (I10) where the intensity of the dye is 10% of maximum. The determination of the amount of dye migrated from pixel intensity measurements was found to be highly affected by cocoa butter structure at times greater than 28 days, but I10 was not. The determination of a model-independent oil migration rate (I10/tn) using this method was found to be highly reproducible and accurate. Due to the observed non-linearity of the oil migration process and the effects of matrix structure on the determination of pixel intensity (and thus mass of dye migrated), the quantification of oil migration using the simplified version of Fick's second law is not recommended.
Keywords: Image analysis; Oil migration kinetics; Confectionery products; Models of diffusion

Daniela Saucedo-Reyes, Aurora Marco-Celdran, Maria Consuelo Pina-Perez, D. Rodrigo, Antonio Martinez-Lopez, Modeling survival of high hydrostatic pressure treated stationary- and exponential-phase Listeria innocua cells, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 135-141, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.11.004.
(http://www.sciencedirect.com/science/article/B6W6D-4V0MRD4-2/2/d1b2551053bef18893e6c2e6d3685afa)
Abstract:
High Hydrostatic Pressure (HHP) inactivation (325-400 MPa; 0-20 min; maximum temperature 30 [degree sign]C) of cells of Listeria innocua CECT 910 was studied in two different growth phases (exponential and stationary), and the corresponding survival curves were obtained for each case. The curves were fitted to two nonlinear models, the modified Gompertz equation and the Baranyi model. The kinetic constants calculated for both models, [micro sign]max and kmax, indicated that cells in exponential growth phase were more sensitive to pressure than those in stationary phase. Both mathematical models were suitable for describing L. innocua HHP survival curves, rendering kinetic constants that increased with increasing pressure. When considering the experimental models validation, both Gompertz and Baranyi predicted in a similar way, however Baranyi had slightly lower Af (Accuracy factor) and Bf (Bias factor) values, which indicated better prediction values. In summary, both mathematical models were perfectly valid for describing L. innocua inactivation kinetics under HHP treatment.Industrial relevance
The mathematical models for inactivation and growth of microorganisms are the foundation of predictive microbiology and are used in risk assessments procedures as part of the food safety

management system. Besides, these models together with those applied to inactivation of enzymes and destruction of quality factors are essential to optimize processes and thus to lay the foundations for industrial processing. It is therefore necessary to identify generally applicable kinetic models that will produce primary and secondary kinetic parameters and are statistically reliable as a key tool to predict the behaviour of microorganisms, enzymes and quality factors after processing.
Keywords: High hydrostatic pressure; Inactivation kinetics; Gompertz and Baranyi models; Listeria innocua; Predictive microbiology

Dario Perez-Conesa, Javier Garcia-Alonso, Veronica Garcia-Valverde, Maria-Dolores Iniesta, Karin Jacob, Luis Manuel Sanchez-Siles, Gaspar Ros, Maria Jesus Periago, Changes in bioactive compounds and antioxidant activity during homogenization and thermal processing of tomato puree, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 179-188, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.12.001.
(http://www.sciencedirect.com/science/article/B6W6D-4V70RB6-1/2/7a24827da83720c1d048bb20870b887b)
Abstract:
The effect of homogenization and thermal processing on a number of bioactive compounds (carotenoids, total phenolics, ascorbic acid and folates) in both raw tomato puree (RTP) and 'hot break' tomato puree (HTP) was investigated. RTP and HTP were homogenized in either one or two-steps, followed by pasteurization at 98 [degree sign]C for 40 s. Additionally, HTP was pasteurized in parallel at 98 [degree sign]C, 108 [degree sign]C and 128 [degree sign]C. In general, homogenization had no effect, but changes were observed after pasteurization (98 [degree sign]C for 40 s). Carotenoids were relatively resistant to thermal degradation, whereas total phenolic content and ascorbic acid significantly decreased. However, a higher content of folates was determined in the homogenized and pasteurized samples due to their higher extraction from the subcellular compartment. The increase in pasteurization temperatures of the HTP up to 128 [degree sign]C led to a decrease of ascorbic acid, total phenolic compounds and folates. In conclusion, homogenization and pasteurization at 98 [degree sign]C for 40 s improves the nutritional value of tomato puree, increasing the extractability of the folates and maintaining the carotenoid content.Industrial relevance
Unlike other vegetables, the tomato is a staple food that is not frequently homogenized by the processing industry, although homogenization could improve product quality. This is why we explored this technique, using one-step and two-step homogenization. The tomato and vegetable processing industry frequently pasteurizes at a constant flow rate, meaning constant heating time. In this study, we employed three different temperatures, using the same time of exposure, to cover different situations in the food industry. Depending on the product's thickness, an increase in the temperature might be needed to reduce any microbiological hazard in the final product. Homogenization followed by pasteurization at 98 [degree sign]C for 40 s resulted in a greater improvement of the nutritional value of tomato puree in all situations tested.
Keywords: Tomato; Homogenization; Pasteurization; Lycopene; [beta]-Carotene; Phenolic compounds; Vitamin C; Folates; Antioxidant activity

V. Ferreira, J. Barbosa, J. Silva, P. Gibbs, T. Hogg, P. Teixeira, Microbiological profile of Salpicao de Vinhais and Chourica de Vinhais from raw materials to final products: Traditional dry sausages produced in the North of Portugal, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 279-283, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.11.001.
(http://www.sciencedirect.com/science/article/B6W6D-4TXF809-2/2/0e7fb4b78a7ebae32e9bd932214b1d12)
Abstract:

Salpicao de Vinhais and Chourica de Vinhais are traditional dry-fermented meat sausages produced in the North of Portugal. The microbiological profile during production of both products was followed in three small processing units. Lactic acid bacteria were the most prevalent microorganisms, with enhanced growth during the smoking process and a consequent decrease of pH.
This study demonstrated that when highly contaminated raw ingredients are used, pathogens might not be eliminated during processing (from seasoning until the end of smoking). Therefore, it is important to highlight that to produce safe Salpicao and Chourica following traditional recipes and methodologies it is necessary to work under hygienic conditions using raw materials of good microbiological quality.Industrial relevance
Preservation of pork meat in the form of semi-dry, fermented and smoked products having a long shelf-life, is an age-old artisanal process that is still practiced in many areas of the world. In many rural communities production has a significant impact on the local economy and food supply, but these products are now becoming increasingly popular in urban areas. In a more widespread distribution of such artisanal products, it is important that consumers are not exposed to undue risks of food-borne infections or intoxications. This study investigates the evolution of the microflora and microbiological safety during the production processes of two such traditional products in the North of Portugal, and during storage of the final products.
Keywords: Salpicao de Vinhais; Chourica de Vinhais; Processing units; Microbiological profile

S. Balasubramanian, V.M. Puri, Thermal energy savings in pilot-scale plate heat exchanger system during product processing using modified surfaces, Journal of Food Engineering, Volume 91, Issue 4, April 2009, Pages 608-611, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.10.014.
(http://www.sciencedirect.com/science/article/B6T8J-4TT2YJB-1/2/2d808590364839aa2583ff3cd74531f2)
Abstract:
A pilot-scale plate heat exchanger (PHE) system having modified surfaces was tested for possible thermal energy savings while pasteurizing milk and tomato juice. The surfaces tested were stainless steel 316 (control), and SS-316 coated with three different commercially available food-grade materials; Lectrofluor-641TM, graded Ni-P-PTFE, and AMC148-18. The PHE system was operated continuously for 6 h at a flow rate of 0.162 m3 h-1channel-1. Of the three coatings, Lectrofluor-641TM had the most promising results. Calculation for total thermal energy consumption indicate that using the Lectrofluor-641TM coated plates results in about 7.68% and 15.86% less energy, respectively, for processing tomato juice and skim milk than when traditional SS-316 plates were used. Overall, results indicate that modifying food processing equipment surface could result in substantial energy savings and need to be explored further.
Keywords: Fouling; Plate heat exchanger; Thermal energy savings; Pasteurization; Coatings

Vincenzo Lattanzio, Paul A. Kroon, Vito Linsalata, Angela Cardinali, Globe artichoke: A functional food and source of nutraceutical ingredients, Journal of Functional Foods, Volume 1, Issue 2, April 2009, Pages 131-144, ISSN 1756-4646, DOI: 10.1016/j.jff.2009.01.002.
(http://www.sciencedirect.com/science/article/B9848-4VR6KD1-1/2/92757cd069e8a3d2555a3d14d1feafd3)
Abstract:
Globe artichoke (Cynara cardunculus L. subsp. scolymus (L.) Hayek, (formerly Cynara scolymus L.) represents an important component of the Mediterranean diet, and is a rich source of bioactive phenolic compounds, and also inulin, fibre and minerals. In addition, artichoke leaf extracts have long been used in folk medicine, particularly for liver complaints. These therapeutic properties have been often been ascribed to the cynarin (1,3-O-dicaffeoylquinic acid) content of these extracts. In various pharmacological test systems, artichoke leaf extracts have exhibited hepatoprotective, anticarcinogenic, antioxidative, antibacterial, anti-HIV, bile-expelling, and

urinative activities as well as the ability to inhibit cholesterol biosynthesis and LDL oxidation. These broad therapeutic indications cannot be ascribed to a single, but to several active compounds that together generate additive or synergistic pharmacologic effects; these include mono- and dicaffeoylquinic acids, and flavonoids such as luteolin and its 7-O-glucoside. Artichoke by-products such as leaves, external bracts and stems that are produced by the artichoke processing industry, represent a huge amount of discarded material (about 80-85% of the total biomass of the plant), which could be used as a source of inulin but also of phenolics, and should be considered as a raw material for the production of food additives and nutraceuticals.
Keywords: Cynara; Caffeoylquinic acids; Cynarin; Flavonoids; Anthocyanin pigments; Inulin; By-products

Hulya Olmez, Ursula Kretzschmar, Potential alternative disinfection methods for organic fresh-cut industry for minimizing water consumption and environmental impact, LWT - Food Science and Technology, Volume 42, Issue 3, April 2009, Pages 686-693, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.08.001.
(http://www.sciencedirect.com/science/article/B6WMV-4T708GP-2/2/465011bf2b95a74f5e3caf389598e170)
Abstract:
Disinfection is one of the most important processing steps affecting the quality and safety and the shelf-life of the end product in fresh-cut processing. Chlorine is the most widely used disinfectant in fresh-cut industry. However, recent outbreaks associated with pathogen contamination in fresh-cut vegetables raised the concerns about the efficacy of chlorine treatment in assuring the safety of the products. Moreover, due to the environmental and health risks posed by the use of chlorine, there is a trend in eliminating chlorine from the disinfection process. Thus, there is a need for alternative sanitizers to be used for the disinfection of fresh-cut vegetables, not only for the organic food sector but also for the conventional food processors. Another challenge for the food industry is the minimization of water consumption and wastewater discharge rates. The United Nations Environment Programme stated that Europe is one of the two global regions where more water is used for industry than for agriculture. Among the different industries, the food industry ranks third in water consumption and wastewater discharge rates coming after the chemical and refinery industries. The adoption of less water consuming systems is required for improved water management in the industry. Therefore the food industry is now seeking alternatives to chlorine which assure the safety of the products, maintain the quality and shelf-life, while also reducing the water consumption rates in processing. Chlorine dioxide, ozone, organic acids, peroxyacetic acid, electrolyzed oxidizing water and hydrogen peroxide are the main alternative sanitizing agents that gained interest in recent years. The effects of these disinfecting agents on the microbiological, nutritional and sensory quality of fresh-cut produce, and also the possible environmental impact and the potential on minimizing water consumption rates in the food industry are reviewed in this manuscript.
Keywords: Fresh-cut vegetables; Organic; Disinfection; Ozone; Chlorine; Wastewater; Environmental impact

Jianchu Chen, John Shi, Sophia Jun Xue, Ying Ma, Comparison of lycopene stability in water- and oil-based food model systems under thermal- and light-irradiation treatments, LWT - Food Science and Technology, Volume 42, Issue 3, April 2009, Pages 740-747, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.10.002.
(http://www.sciencedirect.com/science/article/B6WMV-4TTMK18-1/2/8efea733ffca4e6ba25391f6987dbd9a)
Abstract:
Lycopene can undergo degradation via isomerization and oxidation during processing and storage. These degradative reactions affect its bioactivity and health benefit functionality.

Degradation kinetics and isomerization of lycopene in water- and oil-based tomato model systems were investigated as a function of thermal treatments and light irradiation. Results showed that 80 and 100 [degree sign]C heating favoured the stability of lycopene in oil-based tomato products. The high heating temperatures (120 and 140 [degree sign]C) increased isomerization of lycopene and resulting in degradation of total lycopene and cis-isomers in both water- and oil-based tomato products. However, the levels of degradation of total lycopene contents and cis-isomers were greater in water-based samples than in oil-based model systems under different treatments. Heat and light both promoted lycopene isomerization of the all-trans form to the cis-isomers and further oxidation of cis-isomers. The major effect of thermal degradation and photosensitized oxidation was a significant decrease in the total lycopene content, especially the content of cis-isomers. These research results could be useful in assisting industry to improve processing technology and to improve the nutritional value and health-benefits of tomato-based foods.
Keywords: Degradation; Heating; Light; Lycopene; Oxidation; Stability; Tomato

P.J. Cullen, B.K. Tiwari, C.P. O'Donnell, K. Muthukumarappan, Modelling approaches to ozone processing of liquid foods, Trends in Food Science & Technology, Volume 20, Issues 3-4, April 2009, Pages 125-136, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.049.
(http://www.sciencedirect.com/science/article/B6VHY-4VDS8BT-2/2/693cb3f62d977d276b8400ee29e1d42f)
Abstract:
The approval of ozone as a direct additive to food by the US FDA has resulted in new applications of ozonation in liquid food preservation. However the behaviour of ozone within liquid systems is complex. Therefore to optimise ozonation processes, an understanding of the parameters governing mass transfer between the gas and the liquid in bubble column is required. This paper reviews the chemical reactions which occur between ozone and fluid food systems, and the kinetic models which can be employed to describe the degradation of food quality and nutritional parameters. The proposed mechanisms of microbial inactivation are also discussed along with potential models to describe ozone inactivation kinetics.

B.K. Tiwari, C.P. O'Donnell, P.J. Cullen, Effect of non thermal processing technologies on the anthocyanin content of fruit juices, Trends in Food Science & Technology, Volume 20, Issues 3-4, April 2009, Pages 137-145, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.058.
(http://www.sciencedirect.com/science/article/B6VHY-4VJBTNG-1/2/233262f33fcd0af1d39d27a7b95e6148)
Abstract:
Consumer demand for safe and nutritious fruit juices has led to the development of a number of non thermal food preservation techniques. Recent research has highlighted the importance of anthocyanins in human health and nutrition. In this paper the effects of non thermal preservation technologies including high hydrostatic pressure, pulsed electric field, ultrasound, irradiation and ozone on the stability of anthocyanins are reviewed. The proposed mechanisms for degradation of anthocyanins during non thermal processing are also discussed along with potential factors to enhance their stability during processing and storage.

Kristel De Vleeschouwer, Iesel Van der Plancken, Ann Van Loey, Marc E. Hendrickx, Modelling acrylamide changes in foods: from single-response empirical to multiresponse mechanistic approaches, Trends in Food Science & Technology, Volume 20, Issues 3-4, April 2009, Pages 155-167, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.060.
(http://www.sciencedirect.com/science/article/B6VHY-4VK6N7V-1/2/97ce30670b9a1f9d574f5c3b7cb71479)
Abstract:

This review discusses the current kinetic modelling approaches applied to describe heat-induced acrylamide formation and elimination during processing of foods. As a starting point, some general aspects of kinetic modelling are discussed, including statistically acceptable criteria for selection of the appropriate kinetic model. Both mechanism-based multiresponse modelling and empirical single-response modelling are thoroughly discussed. The complementarity between both approaches and their individual merits are demonstrated. The future challenge in this research field lies in the extension of the current multiresponse model focusing on acrylamide formation and elimination with product-related characteristics that contribute to the organoleptic properties desired by consumers, to approach better complex reaction systems like Maillard reactions in complex systems such as foods. In case of real food systems under real processing conditions, the integration of kinetic models with heat transfer and in some cases mass transfer models will be required in the context of optimization approaches, balancing desired and undesired reactions taking place in complex food systems during processing, which also poses a challenge to the food scientist.

Neil Roder, Catherine Gerard, Aliette Verel, Tatiana Y. Bogracheva, Cliff L. Hedley, Peter R. Ellis, Peter J. Butterworth, Factors affecting the action of [alpha]-amylase on wheat starch: Effects of water availability. An enzymic and structural study, Food Chemistry, Volume 113, Issue 2, 15 March 2009, Pages 471-478, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.07.106.
(http://www.sciencedirect.com/science/article/B6T6R-4T708F1-1/2/8a3930e8e43120effd229b4beb6bb255)
Abstract:
In seeking an explanation for biochemical factors that influence the postprandial glycaemic response of starch-containing foods, a study was made of the action of pancreatic [alpha]-amylase on wheat starch. Samples containing different amounts of water were processed at 100 [degree sign]C before use as substrates for amylase. Structural information on the starch samples was obtained by polarised light microscopy, differential scanning calorimetry (DSC) and X-ray diffraction (XRD), in parallel with the enzyme studies. The catalytic efficiency of [alpha]-amylase was relatively low until the water content reached 30%, whereupon it rose sharply. Surprisingly, the Km value was higher for samples processed at 20-30% water than at 12% water, suggesting that access of the substrate to [alpha]-amylase was less favourable at 20-30% compared with 12% water. Km values fell at higher water levels, indicating greater availability of starch to amylase, presumably as a consequence of increased disorder of starch structure. Using DSC, XRD and microscopy, the anomaly in kinetic behaviour of 20-30% water samples was shown to be due to annealing of starch during processing (heating at 100 [degree sign]C). The enzyme kinetic data proved to be a sensitive probe of changes in starch structure.
Keywords: Amylolysis; Starch processing; DSC; X-ray diffraction

Patrizia Bogani, Maria Minunni, Maria M. Spiriti, Michele Zavaglia, Sara Tombelli, Marcello Buiatti, Marco Mascini, Transgenes monitoring in an industrial soybean processing chain by DNA-based conventional approaches and biosensors, Food Chemistry, Volume 113, Issue 2, 15 March 2009, Pages 658-664, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.07.056.
(http://www.sciencedirect.com/science/article/B6T6R-4T2S8WH-3/2/20d1205d990637dacab240b33a09fb66)
Abstract:
The development of analytical methods for genetically modified organisms (GMO) screening is of great interest. In particular, since even highly processed GMO-derived food products are covered by new European legislations, a great effort has been devoted to the application of the analytical tests to these products.
This work describes a polymerase chain reaction-based qualitative screening assay and a biosensor-based approach to detect transgenes in a Roundup Ready(R) soybean processing line.

Roundup Ready(R) soybean was specifically analyzed in eight types of processed materials - seeds, crushed seeds, expander, crude flour, proteic flour, crude oil, degummed oil and lecithin - all derived from the same initial source and produced during the manufacturing process. Specific combinations of primers were used to differentiate sequences from the whole insert. The amplification of 'marker' fragments with a maximum length of 500 bp was successfully achieved both in raw material (seeds) and in partially (crushed seeds, crude and proteic flours) and highly (crude and degummed oils and fluid lecithin) processed materials.
Moreover, the extraction procedure was optimised and the polymerase chain reaction-electrophoresis analysis has been implemented by a biosensor-based approach.
Keywords: Roundup Ready(R) soybean; Food processing chain; PCR; Piezoelectric biosensor; GMO traceability

J.M. Fuentes-Alventosa, G. Rodriguez-Gutierrez, S. Jaramillo-Carmona, J.A. Espejo-Calvo, R. Rodriguez-Arcos, J. Fernandez-Bolanos, R. Guillen-Bejarano, A. Jimenez-Araujo, Effect of extraction method on chemical composition and functional characteristics of high dietary fibre powders obtained from asparagus by-products, Food Chemistry, Volume 113, Issue 2, 15 March 2009, Pages 665-671, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.07.075.
(http://www.sciencedirect.com/science/article/B6T6R-4T3DD19-J/2/5eaba7cac43d11553bbca06fea8fa917)
Abstract:
Asparagus (Asparagus officinalis L.) by-products, which represent around 50% of the processed vegetable, are a potential source of dietary fibre. The way that these by-products are treated affects the composition and functional properties of fibre-rich powders. Factors such as treatment intensity, solvent, and drying system were studied. Only the more soluble components (soluble sugars, uronic acids and proteins) showed significant differences. All the fibre-rich powders had high concentrations of TDF (62-77%). The IF/SF proportion decreased with the severity of treatment, in this way increasing the physiological quality of the fibre. Functional properties, namely water-holding capacity (WHC), oil-holding capacity (OHC), solubility (SOL), and glucose dialysis retardation index (GDRI), varied according to the preparation procedure. WHC and GDRI were higher in intensely extracted fibres; due to the effect of thermal processing. WHC showed values (11-20 ml water/g powder) similar to those described for other agricultural by-products, but OHC and GDRI were much higher (5-8 ml oil/g powder and 25-45%, respectively). These properties make fibre-rich powders from asparagus by-products a valuable source of dietary fibre to be included in the formulation of fibre-enriched foods.
Keywords: Asparagus by-product; Dietary fibre; Chemical composition; Functional characteristics; Glucose dialysis retardation index; Fibre-enriched food

J. Ruprich, I. Rehurkova, P.E. Boon, K. Svensson, S. Moussavian, H. Van der Voet, S. Bosgra, J.D. Van Klaveren, L. Busk, Probabilistic modelling of exposure doses and implications for health risk characterization: Glycoalkaloids from potatoes, Food and Chemical Toxicology, In Press, Corrected Proof, Available online 13 March 2009, ISSN 0278-6915, DOI: 10.1016/j.fct.2009.03.008.
(http://www.sciencedirect.com/science/article/B6T6P-4VTVR42-2/2/2948f58cbef61648ff07617754bc5d3f)
Abstract:
Potatoes are a source of glycoalkaloids (GAs) represented primarily by [alpha]-solanine and [alpha]-chaconine (about 95%). Content of GAs in tubers is usually 10-100 mg/kg and maximum levels do not exceed 200 mg/kg. GAs can be hazardous for human health. Poisoning involve gastrointestinal ailments and neurological symptoms. A single intake of >1-3 mg/kg b.w. is considered a critical effect dose (CED). Probabilistic modelling of acute and chronic (usual) exposure to GAs was performed in the Czech Republic, Sweden and The Netherlands. National

databases on individual consumption of foods, data on concentration of GAs in tubers (439 Czech and Swedish results) and processing factors were used for modelling. Results concluded that potatoes currently available at the European market may lead to acute intakes >1 mg GAs/kg b.w./day for upper tail of the intake distribution (0.01% of population) in all three countries. 50 mg GAs/kg raw unpeeled tubers ensures that at least 99.99% of the population does not exceed the CED. Estimated chronic (usual) intake in participating countries was 0.25, 0.29 and 0.56 mg/kg b.w./day (97.5% upper confidence limit). It remains unclear if the incidence of GAs poisoning is underreported or if assumptions are the worst case for extremely sensitive persons.
Keywords: Potatoes; Glycoalkaloids; Exposure assessment; Probabilistic modelling; Health risk

Fitz-Binder Christa, Bechtold Thomas, Sorption of alkaline earth metal ions Ca2+ and Mg2+ on lyocell fibres, Carbohydrate Polymers, Volume 76, Issue 1, 2 March 2009, Pages 123-128, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2008.10.010.
(http://www.sciencedirect.com/science/article/B6TFD-4TRCYF0-1/2/5c007ec71723650f2a0bd42ccedca0d3)
Abstract:
Ca2+ and Mg2+ content of cellulose fibres is of relevance for a wide range of applications e.g. textile processing, pulp/paper, food. Sorption of Ca2+ and Mg2+ ions were found on lyocell type regenerated cellulose fibres. Higher affinity was found for Ca2+ ions compared to Mg2+ ions. At pH 9, fibre saturation was observed at a calcium binding capacity of 18-20 mmol/kg. A carboxylic group content of 18 mmol COOH per kg fibre material was determined based on the Methylene Blue absorption. This indicates a 1:1 molar stoichiometry between the carboxylic groups present in the fibres and the bound Ca2+ ions. Thus it is proposed that the salt in fibre shows the general composition (Cell-O- Ca2+ X-), X- being an anion bound in the salt to achieve charge neutrality.
The sorption of Ca2+ also can be demonstrated by complex formation with 1,2-dihydroxy-9,10-anthraquinone (alizarin) which forms a red-violet Ca2+-complex. Colour fixation thus can be used as an indicator for the Ca2+-ions bound in the fibre.
Keywords: Calcium; Cellulose; Lyocell; Carboxylic group; Methylene Blue; Alizarin

L. Neves, R. Oliveira, M.M. Alves, Co-digestion of cow manure, food waste and intermittent input of fat, Bioresource Technology, Volume 100, Issue 6, March 2009, Pages 1957-1962, ISSN 0960-8524, DOI: 10.1016/j.biortech.2008.10.030.
(http://www.sciencedirect.com/science/article/B6V24-4V1D7M1-3/2/8a18a37dd8e5d790ba7f11e1a110df36)
Abstract:
Pulses of oil were added to completely mixed reactors fed with dairy cow manure and food waste, after achieving a stable performance at an organic loading rate of 4.6 +/- 0.1 gCOD/(lreactor day), an oily waste effluent from a canned fish processing industry was fed in the form of pulses. The oil concentration rose up to 9, 12, 15 and 18 gCODoil/lreactor, after the pulse feeding in the reactor. The highest fat concentration of 18 gCODoil/lreactor promoted a persistent inhibition in the process of the continuous reactor, although in batch assays, the reactor content evidenced a capacity to degrade more oil and to degrade the accumulated organic matter. All the other pulses had a positive effect in the methane production. From a practical point of view, this work demonstrates that controlled intermittent inputs of oil can enhance the methane production in a co-digestion of cow manure and food waste.
Keywords: Cow manure; Anaerobic co-digestion; Lipids; Food waste; Oily effluent

Maribel Ovando-Martinez, Sonia Sayago-Ayerdi, Edith Agama-Acevedo, Isabel Goni, Luis A. Bello-Perez, Unripe banana flour as an ingredient to increase the undigestible carbohydrates of pasta, Food Chemistry, Volume 113, Issue 1, 1 March 2009, Pages 121-126, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.07.035.

(http://www.sciencedirect.com/science/article/B6T6R-4T2638V-2/2/ca7147c5544cdf7619c9be8344938990)
Abstract:
Banana is a starchy food that contains a high proportion of undigestible compounds, such as resistant starch and non-starch polysaccharides. There is an excess of production and large quantities of bananas are lost. The objective of this study was to use unripe banana flour as a food ingredient to make pasta (spaghetti) of high quality, on the basis of low-carbohydrate digestibility, and increased resistant starch and antioxidant phenolics contents.
Formulations consisting of 100% durum wheat semolina (control) and mixtures of semolina:banana flour of 85:15, 70:30 and 55:45 were prepared for spaghetti processing.
Nutritional composition, in vitro kinetics of starch digestion and antioxidant capacity were determined. The addition of banana flour increased the indigestible fraction and the content of phenolic compounds in the spaghetti. As a consequence of the compositional changes, a slow, low rate for the enzymatic hydrolysis of carbohydrates was observed. Moreover, banana flour spaghetti possessed increased antioxidant capacity.
Keywords: Pasta; Banana flour; Undigestible carbohydrate; Antioxidant capacity

Sankaran Durairaj, Tanmay Basak, A new microwave processing strategy for food-ceramic composite layer confined within ceramic plates, Food Research International, Volume 42, Issue 2, March 2009, Pages 254-270, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.11.003.
(http://www.sciencedirect.com/science/article/B6T6V-4TYYPV1-1/2/dfb5af03c0f1c3e8db6f461367605a7d)
Abstract:
A theoretical analysis has been carried out to study the efficient microwave processing of discrete food sample ceramic composite attached with ceramic (Al2O3 and SiC) plates. Continuous food sample with a specific thickness corresponding to smaller power absorption is replaced by two discrete samples and processed with ceramic composite. The effective power and temperature distribution are found to be function of discrete food sample ratios, type of microwave incidence and ceramic layer thickness. The effect of ceramic material on various discrete sample ratios have been studied via effective average power vs. thickness of ceramic (Al2O3 or SiC) intermediate for one side and both sides microwave incidence. It is found that power absorption is enhanced significantly for beef sample due to specific thickness of ceramic composite corresponding to one side microwave incidence. The power enhancement is lesser and the temperature difference or thermal runaway is larger for bread samples as compared to beef samples. The enhancement of heat absorption is larger for one side incidence as compared to both sides incidence with identical total intensity of microwave incidence. The role of discrete samples with ceramic composites is significant for highly lossy substances (beef) whereas the composites do not play significant role on optimal processing of low lossy substances (bread).
Keywords: Microwave; Discrete food samples; Food processing; Ceramic layer; Thermal runaway

Gary Tucker, Emma Hanby, Helen Brown, Development and application of a new time-temperature integrator for the measurement of P-values in mild pasteurisation processes, Food and Bioproducts Processing, Volume 87, Issue 1, March 2009, Pages 23-33, ISSN 0960-3085, DOI: 10.1016/j.fbp.2008.04.001.
(http://www.sciencedirect.com/science/article/B8JGD-4SN91R3-1/2/e53b8f9bcf423533509f92a82226645c)
Abstract:
A new time-temperature integrator (TTI) for the measurement of mild pasteurisation treatments is described. The objective was to measure thermal processes of the order of a few minutes at 70 [degree sign]C. Food products that receive these treatments are intended for sale either under refrigerated conditions with <10 days storage, or are naturally high in acid that allows ambient

storage for many months. The new TTI, referred to as BAA70, consisted of 0.5 mg/mL [alpha]-amylase from Bacillus amyloliquefaciens in 10 mM acetate buffer. Decimal reduction time (D70-value) of 8.4 min and z-value of 8.9 C[degree sign] were calculated for BAA70 in a water bath. Maximum P-values measured with BAA70 were up to 25.2 min at 70 [degree sign]C. Industrial evaluation for surface pasteurisation in hot-filled mini jam jars and for continuous oven cooking of quiches demonstrated the applicability of the BAA70 TTI. P-Values in both these operations could not be measured using conventional temperature sensors and so the TTIs provided invaluable data on pasteurisation achieved.
Keywords: Thermal processing; Pasteurisation; Time-temperature integrator; Hot filling; Ovens

Rosiele Lappe, Florencia Cladera-Olivera, Ana Paula Melo Dominguez, Adriano Brandelli, Kinetics and thermodynamics of thermal inactivation of the antimicrobial peptide cerein 8A, Journal of Food Engineering, Volume 91, Issue 2, March 2009, Pages 223-227, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.08.025.
(http://www.sciencedirect.com/science/article/B6T8J-4TCHKDB-2/2/77df35ec759f23596559441ec031a1e3)
Abstract:
Optimization of thermal processes relies on adequate degradation kinetic models to warrant food safety and quality. The knowledge on thermal inactivation kinetics of bacteriocins is necessary to allow their adequate use as natural biopreservatives in the food industry. In this work, the kinetics of thermal inactivation was studied for the previously characterized bacteriocin cerein 8A. Samples of cerein 8A were treated at different time-temperature combinations in the range of 0-30 min and 70-82 [degree sign]C and the thermodynamic and kinetic parameters for bacteriocin inactivation were calculated. Results showed that inactivation followed a first-order reaction with k-values between 0.059 min-1 and 0.235 min-1. D- and k-values decreased and increased, respectively, with increasing temperature, indicating a faster bacteriocin inactivation at higher temperatures. Results suggest that cerein 8A is a relatively thermostable bacteriocin with a z-value of 21.98 [degree sign]C and Ea of 105.7 kJ mol-1.
Keywords: Bacillus cereus; Bacteriocin; Cerein; Antibacterial peptide; Inactivation kinetics; Thermal processing; Thermodynamic activation parameters

G.I. Katsaros, P. Katapodis, P.S. Taoukis, High hydrostatic pressure inactivation kinetics of the plant proteases ficin and papain, Journal of Food Engineering, Volume 91, Issue 1, March 2009, Pages 42-48, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.08.002.
(http://www.sciencedirect.com/science/article/B6T8J-4T5TPDP-2/2/711bf4d3a67a9ab39980dce246ef154f)
Abstract:
Papain and ficin are general non-specific plant thiol proteases applied in food processing. Inactivation kinetics of papain and ficin were studied for thermal (50-80 [degree sign]C, ambient pressure) and high pressure/temperature (500-900 MPa at 50-80 [degree sign]C) process conditions. The effect of temperature at each pressure and the effect of pressure at each temperature were expressed by the values of activation energy, Ea, and activation volume, Va. The two enzymes showed the same inactivation under thermal process. At high pressures, at each process temperature, increase of pressure increases the inactivation rate. Up to 60 [degree sign]C for ficin and 70 [degree sign]C for papain, inactivation rates at high pressures are higher than the corresponding thermal rates at ambient pressure. At higher temperatures up to certain pressures an antagonistic effect was observed. At 80 [degree sign]C thermal inactivation rates at all high pressures are lower than the ones at ambient pressure. Ea increased for papain (from 50 to 88 kJ/mol) and decreased for ficin (from 139 to 43 kJ/mol) as process pressure increased, a different effect of pressure on temperature sensitivity. Va depended on process temperature showing increasing effect of pressure at higher temperatures for papain and decreasing for ficin. The

enzymes inactivation rate constant was modeled as a function of both temperature and pressure conditions by a multi-parameter equation. Overall, papain and ficin showed a high thermal and pressure stability requiring intense process conditions for adequate inactivation.
Keywords: Papain; Ficin; High pressure; Enzyme kinetics; Thermal inactivation

F. Marra, M. Zell, J.G. Lyng, D.J. Morgan, D.A. Cronin, Analysis of heat transfer during ohmic processing of a solid food, Journal of Food Engineering, Volume 91, Issue 1, March 2009, Pages 56-63, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.08.015.
(http://www.sciencedirect.com/science/article/B6T8J-4T8JX85-1/2/13c641425a87ce0c948e369cd52268c9)
Abstract:
To produce a safe cooked food product it is necessary to ensure a uniform heating process. The aim of this study was to develop a mathematical model of a solid food material undergoing heating in a cylindrical batch ohmic heating cell. Temperature profiles and temperature distribution of the ohmic heating process were simulated and analysed via experimental and mathematical modelling which incorporated appropriate electromagnetic and thermal phenomena. Temperature profiles were measured at nine different symmetrically arranged locations inside the cell. The material was ohmically heated imposing a voltage of 100 V, while electrical field and thermal equations were solved for experimental and theoretical models by the use of FEMLAB, a finite element software. Reconstituted potato was chosen to represent a uniform solid food material and physical and electrical properties were determined prior to the experiment as a function of temperature. The simulation provided a good correlation between the experimental and the mathematical model. No cold spots within the product were detected but both experimental and model data analysis showed slightly cold regions and heat losses to the electrode and cell surfaces. The designed model could be used to optimize the cell shape and electrode configurations and to validate and ensure safe pasteurisation processes for other solid food materials.
Keywords: Ohmic heating; Heat transfer modelling; FEM

Andrew Deane, First contact: Understanding the relationship between hominoid incisor curvature and diet, Journal of Human Evolution, Volume 56, Issue 3, March 2009, Pages 263-274, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2009.01.006.
(http://www.sciencedirect.com/science/article/B6WJS-4VPKPTT-1/2/7dc5951732283fd4eaef794351c1ed96)
Abstract:
Accurately interpreting fossil primate dietary behaviour is necessary to fully understand a species' ecology and connection to its environment. Traditional methods developed to infer diet from hominoid teeth successfully group taxa into broad dietary categories (i.e., folivore, frugivore) but often fail to represent the range of dietary variability characteristic of living apes. This oversimplification is not only a consequence of poor resolution, but may also reflect the use of similar fallback resources by closely related taxa with dissimilar diets. This study demonstrates that additional dietary specificity can be achieved using a morphometric approach to hominoid incisor curvature. High-resolution polynomial curve fitting (HR-PCF) was used to quantify the incisor curvatures of closely related hominoid taxa that have dissimilar diets but similar morphological adaptations to specific keystone resources (e.g., Gorilla gorilla beringei vs. G. g. gorilla). Given the key role of incisors in food processing, it is reasonable to assume that these teeth will be at least partially influenced by the unique selective pressures imposed by the mechanical loading specific to individual diets. Results from this study identify a strong correlation between hominoid dietary proportions and incisor linear dimensions and curvature, indicating that more pronounced incisor curvature is positively correlated with higher levels of frugivory. Hard-object frugivores have the greatest mesiodistal and cervico-incisal curvature and dedicated folivores have the least curved incisors. Mixed folivore/frugivores are morphological intermediates

between dedicated folivores and hard- and soft-object frugivores. Mesiodistal curvature varied only in the degree of curvature; however, cervico-incisal curvature was shown to differ qualitatively between more frugivorous and more folivorous taxa. In addition to identifying a greater range of dietary variability among hominoids, this study also demonstrates that HR-PCF is capable of identifying morphological distinctions between closely related taxa with overlapping diets that rely on similar fallback foods (e.g., Pan paniscus vs. P. troglodytes).
Keywords: Fallback food; High-resolution polynomial curve fitting; Hominoid diet; Incisor curvature; Incisor morphometrics; Keystone resource

Andrew S. Deane, Early Miocene catarrhine dietary behaviour: the influence of the Red Queen Effect on incisor shape and curvature, Journal of Human Evolution, Volume 56, Issue 3, March 2009, Pages 275-285, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2008.09.007.
(http://www.sciencedirect.com/science/article/B6WJS-4VTN82T-2/2/c8116de46c9c284bfbec7d4e91d9bf13)
Abstract:
The early Miocene catarrhine fossil record of East Africa represents a diverse and extensive adaptive radiation. It is well accepted that these taxa encompass a dietary range similar to extant hominoids, in addition to some potentially novel dietary behaviour. There have been numerous attempts to infer diet for these taxa from patterns of dental allometry and incisor and molar microwear, however, morphometric analyses until now have been restricted to the post-canine dentition. It has already been demonstrated that given the key functional role of the incisors in pre-processing food items prior to mastication, there is a positive correlation between diet and incisal curvature (Deane, A.S., Kremer, E.P., Begun, D.R., 2005. A new approach to quantifying anatomical curvatures using High Resolution Polynomial Curve Fitting (HR-PCF). Am. J. Phys. Anthropol. 128(3), 630-638.; Deane, A.S., 2007. Inferring dietary behaviour for Miocene hominoids: A high-resolution morphometric approach to incisal crown curvature. Ph.D. Dissertation. The University of Toronto.). This study seeks to re-examine existing dietary hypotheses for large-bodied early Miocene fossil catarrhines by contrasting the incisal curvature for these taxa with comparative models derived from prior studies of the correlation between extant hominoid incisor curvature and feeding behaviour. Incisor curvature was quantified for 78 fossil incisors representing seven genera, and the results confirm that early Miocene fossil catarrhines represent a dietary continuum ranging from more folivorous (i.e., Rangwapithecus) to more frugivorous (i.e., Proconsul) diets, as well as novel dietary behaviours that are potentially similar to extant ceboids (i.e., Afropithecus). Additionally, early Miocene fossil catarrhine incisors are less curved than extant hominoid incisors, indicating a general pattern of increasing mesio-distal and labial curvature through time. This pattern of morphological shifting is consistent with the Red Queen Effect (Van Valen, L., 1973. A new evolutionary law. Evol. Theory 1, 1-30), which predicts that taxa that are removed from one another by geological time, although potentially having similar diets, may exhibit differing degrees of a similar dietary adaptation (i.e., differing degrees of incisal curvature).
Keywords: Curvature; High-resolution polynomial curve fitting (HR-PCF); Dental morphometrics; Hominoid; Diet; Proconsul; Afropithecus; Rangwapithecus; Morotopithecus

Jeannette M. Schenk, Marian L. Neuhouser, Daniel W. Lin, Alan R. Kristal, A Dietary Intervention to Elicit Rapid and Complex Dietary Changes for Studies Investigating the Effects of Diet on Tissues Collected during Invasive Surgical Procedures, Journal of the American Dietetic Association, Volume 109, Issue 3, March 2009, Pages 459-463, ISSN 0002-8223, DOI: 10.1016/j.jada.2008.11.026.
(http://www.sciencedirect.com/science/article/B758G-4VPG68V-R/2/64e98c326ce2ede6e7bff93a872ea30a)
Abstract:

Nutrition intervention trials in patients undergoing surgical treatment for cancer offer a unique opportunity to study the mechanisms and pathways that underlie diet and cancer associations in target tissues. However, due to the short time period between diagnosis and treatment, traditional dietary intervention methods are not feasible. This report describes a novel dietary intervention program designed to elicit rapid and complex dietary change during a condensed study period. The intervention, based on Consumer Information Processing, used standardized menus and exchange lists to guide food choices, and was delivered using a single, in-person session followed by telephone-based counseling. This intervention program was used in a small pilot study evaluating the short-term effects of dietary change in men with newly diagnosed prostate cancer. Eight men were randomly assigned to either a low-fat/low-glycemic load or standard American diet during the 4 weeks preceding prostate surgery. Participants completed 24-hour dietary recalls each week, and were weighed at baseline and at surgery. Compared to men in the standard American arm (n=4), men in the low-fat/low-glycemic arm (n=4) reported consuming less total fat (51.0+/-36.0 vs 93.5+/-8.4 g/day, P=0.06), and had a lower glycemic load (134.8+/-6.0 vs 266.3+/-36.8 units/day, P<0.001). Men in the low-fat/low-glycemic arm lost a mean of 5.3+/-1.7 kg and men in the standard American arm gained 0.8+/-4.5 kg (P=0.04). Results of this small pilot study suggest that a relatively simple and minimally burdensome dietary intervention can elicit rapid and complex dietary changes that are maintained over a 4-week study period. Further studies in larger and more diverse populations are needed to fully understand the potential of this novel intervention approach.

Latif Taskaya, Jacek Jaczynski, Flocculation-enhanced protein recovery from fish processing by-products by isoelectric solubilization/precipitation, LWT - Food Science and Technology, Volume 42, Issue 2, March 2009, Pages 570-575, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.09.012.
(http://www.sciencedirect.com/science/article/B6WMV-4TJTXDW-2/2/4bf0c67d83d876464d068252a54e5044)
Abstract:
Muscle proteins were recovered from rainbow trout processing by-products (fish meat leftover on bones, head, skin, and etc.) by isoelectric solubilization/precipitation. Muscle proteins precipitated at pH 5.5 are typically recovered by high-speed centrifugation at a laboratory scale, which appears to impede process scale-up. Our objective was to investigate the effect of flocculants on separation of precipitated proteins from process water (supernatant). Flocculants with different surface charge properties and molecular weights (Mw) were added to precipitated proteins. Protein separation was evaluated by determining optical density (OD) of the supernatant using Bradford dye-binding method. A high Mw anionic flocculent at 100 mg/L resulted in excellent protein separation following 10 min reaction. The OD of the supernatant was comparable to that of clear water, suggesting that even water-soluble fish muscle proteins were removed from the process water. Freeze-thaw cycles, commonly encountered in the fish processing industry, resulted in even more rapid flocculation reaction. This flocculent could be added to a bio-reactor that precipitates muscle proteins at pH 5.5 in a continuous isoelectric solubilization/precipitation system. However, effects of the flocculants on human and animal health should be determined and appropriate approvals obtained before the recovered muscle proteins can be used in human food products and/or animal feeds.
Keywords: Fish processing by-products; Fish proteins; Protein flocculation; Protein recovery; Isoelectric point; Isoelectric solubilization/precipitation

Alvin A. Gajadhar, Edoardo Pozio, H. Ray Gamble, Karsten Nockler, Charlotte Maddox-Hyttel, Lorry B. Forbes, Isabelle Vallee, Patrizia Rossi, Albert Marinculic, Pascal Boireau, Trichinella diagnostics and control: Mandatory and best practices for ensuring food safety, Veterinary Parasitology, Volume 159, Issues 3-4, Special Issue: Selected papers presented at the 12th

International Conference on Trichinellosis - Plitvice Lakes National Park, Croatia, 23 February 2009, Pages 197-205, ISSN 0304-4017, DOI: 10.1016/j.vetpar.2008.10.063.
(http://www.sciencedirect.com/science/article/B6TD7-4TRK0V1-9/2/282adfa095c353da6fb64742b74d6466)
Abstract:
Because of its role in human disease, there are increasing global requirements for reliable diagnostic and control methods for Trichinella in food animals to ensure meat safety and to facilitate trade. Consequently, there is a need for standardization of methods, programs, and best practices used in the control of Trichinella and trichinellosis. This review article describes the biology and epidemiology of Trichinella, and describes recommended test methods as well as modified and optimized procedures that are used in meat inspection programs. The use of ELISA for monitoring animals for infection in various porcine and equine pre- and post-slaughter programs, including farm or herd certification programs is also discussed. A brief review of the effectiveness of meat processing methods, such as freezing, cooking and preserving is provided. The importance of proper quality assurance and its application in all aspects of a Trichinella diagnostic system is emphasized. It includes the use of international quality standards, test validation and standardization, critical control points, laboratory accreditation, certification of analysts and proficiency testing. Also described, are the roles and locations of international and regional reference laboratories for trichinellosis where expert advice and support on research and diagnostics are available.
Keywords: Trichinella; Trichinellosis; Diagnosis; Detection methods; Quality assurance; Control; Biology; Epidemiology; Reference laboratories

Gorji Marzban, Anita Herndl, Sara Pietrozotto, Srijib Banerjee, Christian Obinger, Fatemeh Maghuly, Rainer Hahn, Donato Boscia, Hermann Katinger, Margit Laimer, Conformational changes of Mal d 2, a thaumatin-like apple allergen, induced by food processing, Food Chemistry, Volume 112, Issue 4, 15 February 2009, Pages 803-811, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.06.051.
(http://www.sciencedirect.com/science/article/B6T6R-4SVKSVW-2/2/f64c7a1317c04cd954ecb3a48ebd477b)
Abstract:
Mal d 2, a thaumatin-like protein from apple was previously described to react to almost 75% of the apple allergic patient sera. Based on the molecular structure of this protein, the present study focused on the conformational stability of Mal d 2 in relation to in vitro IgE-binding under different physico-chemical conditions and proteolysis. The structural integrity of Mal d 2 was monitored using SDS-PAGE, Western blotting using polyclonal antibodies and human sera, fluorescence spectrometry and circular dichroism. Results confirmed the stability of Mal d 2. However, Mal d 2 was reactive to human serum IgEs mainly after reduction of disulphide bridges fixing the [alpha]-helical domain II. Contrary to previous assumptions, the current findings suggest that the allergenic epitopes of Mal d 2 are hidden inside the protein structure and none of the rigorous conditions applied in industrial juice processing or digestive proteolysis enhance or reduce the binding to IgE molecules.
Keywords: Fruit processing; Apple allergen; IgE-reactivity; Allergen stability

M.R. Khan, L.M. Bertus, R. Busquets, L. Puignou, Mutagenic heterocyclic amine content in thermally processed offal products, Food Chemistry, Volume 112, Issue 4, 15 February 2009, Pages 838-843, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.06.045.
(http://www.sciencedirect.com/science/article/B6T6R-4SVKSVW-7/2/de8a60a50a0f42f37769744ce6ea4ef9)
Abstract:

Heterocyclic amines (HAs) are potent mutagens formed during heat-processing of proteinaceous food. PhIP is the most ubiquitous and abundant mutagenic HA. In this study several offal products (beef liver, lamb kidney and beef tongue) have been thermally processed and analysed for HAs for the first time. Norharman and harman were the amines most abundant, found at concentrations below 2 ng g-1. PhIP was only formed up to 0.12 ng g-1. Among the rest of HAs analysed, only DMIP, MeIQx and 4,8-DiMeIQx were detectable in cooked kidney and tongue up to 0.25 ng g-1. The influence of cooking additives on HAs formation was evaluated, finding higher levels of norharman and harman, up to 8.87 ng g-1, in liver processed with additives, whereas similar levels of the rest of HAs were found in these samples. The low amounts of HAs found after the prolonged thermal treatments over 200 [degree sign]C indicates that offal products are among the types of meat that produce lowest exposure to HA.
Keywords: Heterocyclic amines; Mutagens; Offal; Mass spectrometry

Maarten Nauta, Andy Hill, Hanne Rosenquist, Sigrid Brynestad, Alexandra Fetsch, Peter van der Logt, Aamir Fazil, Bjarke Christensen, Elly Katsma, Birgitte Borck, Arie Havelaar, A comparison of risk assessments on Campylobacter in broiler meat, International Journal of Food Microbiology, Volume 129, Issue 2, 15 February 2009, Pages 107-123, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.12.001.
(http://www.sciencedirect.com/science/article/B6T7K-4V3HF5K-2/2/61c82236882fc2ecd9c648e2a390c998)
Abstract:
In recent years, several quantitative risk assessments for Campylobacter in broiler meat have been developed to support risk managers in controlling this pathogen. The models encompass some or all of the consecutive stages in the broiler meat production chain: primary production, industrial processing, consumer food preparation, and the dose-response relationship. The modelling approaches vary between the models, and this has supported the progress of risk assessment as a research discipline. The risk assessments are not only used to assess the human incidence of campylobacteriosis due to contaminated broiler meat, but more importantly for analyses of the effects of control measures at different stages in the broiler meat production chain.
This review paper provides a comparative overview of models developed in the United Kingdom, Denmark, the Netherlands and Germany, and aims to identify differences and similarities of these existing models. Risk assessments developed for FAO/WHO and in New Zealand are also briefly discussed.
Although the dynamics of the existing models may differ substantially, there are some similar conclusions shared between all models. The continuous introduction of Campylobacter in flocks implies that monitoring for Campylobacter at the farm up to one week before slaughter may result in flocks that are falsely tested negative: once Campylobacter is established at the farm, the within-flock prevalence increases dramatically within a week. Consequently, at the point of slaughter, the prevalence is most likely to be either very low (< 5%) or very high (> 95%). In evaluating control strategies, all models find a negligible effect of logistic slaughter, the separate processing of positive and negative flocks. Also, all risk assessments conclude that the most effective intervention measures aim at reducing the Campylobacter concentration, rather than reducing the prevalence. During the stage where the consumer handles the food, cross-contamination is generally considered to be more relevant than undercooking. An important finding, shared by all, is that the tails of the distributions describing the variability in Campylobacter concentrations between meat products and meals determine the risks, not the mean values of those distributions.
Although a unified model for risk assessment of Campylobacter in the broiler meat production would be desirable in order to promote a European harmonized approach, it is neither feasible nor desirable to merge the different models into one generic risk assessment model. The purpose of such a generic model has yet to be defined at a European level and the large variety in practices

between countries, especially related to consumer food preparation and consumption, complicates a unified approach.
Keywords: Quantitative microbial risk assessment; Campylobacter; Broiler meat

Domenico Meloni, Pietro Galluzzo, Anna Mureddu, Francesca Piras, Mansel Griffiths, Rina Mazzette, Listeria monocytogenes in RTE foods marketed in Italy: Prevalence and automated EcoRI ribotyping of the isolates, International Journal of Food Microbiology, Volume 129, Issue 2, 15 February 2009, Pages 166-173, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.11.014.
(http://www.sciencedirect.com/science/article/B6T7K-4TY9MJ7-1/2/093435dce6dd96784f8b8e844dd3a1d3)
Abstract:
The aims of the present study were: (a) to investigate the prevalence and the enumeration of Listeria monocytogenes in 200 samples of ready to eat (RTE) foods of animal and vegetal origin collected from different outlets and processing plants in Sardinia; (b) to characterize the isolates by phenotypical and molecular methods; (c) to analyze a subset of 42 L. monocytogenes by automated EcoRI ribotyping in order to predict the strain's potential virulence for humans. The strains were isolated from: smoked fish products, cooked marinated products, meat products and pre-packaged mixed vegetable salads. Of the samples tested, 22% were positive for Listeria spp. The prevalence of L. monocytogenes was 9.5%, while the level of L. monocytogenes in the positive samples was < 10 cfu/g in 94.7% of cases. EcoRI ribotyping differentiated the isolates into 16 distinct ribotypes (similarity > 93%), belonging to 17 different DuPont Identification Library Codes (DUP-IDs) clones. The Simpson's numerical index of discrimination was 0.911. Cluster analysis pointed out a high similarity among strains isolated from meat, fish, and vegetables of different origin. These results confirmed the existence of a widespread population of L. monocytogenes, characterized by highly related strains existing in different geographical areas. 65% of these strains belonged to lineage II (serotypes 1/2a and 1/2c), subtypes known to be associated with sporadic human listeriosis outbreaks. The remaining 35% of the isolates (serotypes 1/2b, 3b and 4b) were allocated to lineage I and belong to distinct clonal groups (DUP-ID 1038 and 1042), which again have been associated with several outbreaks of human listeriosis. Neither atypical profiles nor lineage III strains were found. EcoRI ribotyping was confirmed as a rapid and reliable method for L. monocytogenes typing, providing useful data for epidemiologic and clonality surveys of L. monocytogenes strains isolated from RTE foods.
Keywords: Listeria monocytogenes; RTE foods; EcoRI ribotyping; Epidemiology; Lineages

Niels Skovgaard, Drying technologies in food processing, International Journal of Food Microbiology, Volume 129, Issue 2, 15 February 2009, Page 209, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.12.004.
(http://www.sciencedirect.com/science/article/B6T7K-4V3HHD0-1/2/c47109e8f269202f0eb315759f17bcd2)

Henriette Boel Nielsen, Anne-Mette Sonne, Klaus G. Grunert, Diana Banati, Annamaria Pollak-Toth, Zoltan Lakner, Nina Veflen Olsen, Tanja Pajk Zontar, Marjana Peterman, Consumer perception of the use of high-pressure processing and pulsed electric field technologies in food production, Appetite, Volume 52, Issue 1, February 2009, Pages 115-126, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.09.010.
(http://www.sciencedirect.com/science/article/B6WB2-4TGHN5Y-1/2/2602b2ff38a66e17e38ce4281ed33a5e)
Abstract:
The success of new food processing technologies is highly dependent on consumers' acceptance. The purpose of this paper is to study consumers' perceptions of two new processing technologies and food products produced by means of these novel technologies. To accomplish this, a

qualitative study on consumer attitudes towards high-pressure processing (HPP) and pulsed electric field (PEF) processing of food was carried out. In all 97 adults between 20 and 71 years of age participated in 12 focus groups conducted in Slovenia, Hungary, Serbia, Slovakia, Norway and Denmark using a common guideline. Participants were introduced to the HPP and PEF technologies and then to the effect of the two new technologies on two specific product categories: juice and baby food. The transcribed data was content analysed and the coded data was transformed into diagrams using UCINET 5 and NETDRAW. The results show that consumers perceived the main advantages of HPP and PEF products to be the products' naturalness, improved taste and their high nutritional value, whereas the main disadvantage was the lack of information about the PEF and HPP products. The results of the participants' evaluation of the PEF and HPP processes showed that environmental friendliness and the more natural products were seen as the main advantages, while they were concerned about body and health, the higher price of the products, the lack of information about the technologies and a general scepticism. The study also shows that North European participants were a bit more sceptical towards PEF and HPP products than the East European participants.
Keywords: High-pressure processing; Pulsed electric field; Novel food; Consumer attitudes

Geraldine Fleurance, Herve Fritz, Patrick Duncan, Iain James Gordon, Nadege Edouard, Celine Vial, Instantaneous intake rate in horses of different body sizes: Influence of sward biomass and fibrousness, Applied Animal Behaviour Science, Volume 117, Issues 1-2, February 2009, Pages 84-92, ISSN 0168-1591, DOI: 10.1016/j.applanim.2008.11.006.
(http://www.sciencedirect.com/science/article/B6T48-4V936HC-1/2/c814c46a8cca40860dd30ef0a0f68c38)
Abstract:
The functional response, that is the relationship between the food intake rate of a forager and the availability of food items, has been subject to numerous investigations in ruminants. In horses however, the functional response has been poorly studied despite of the importance of grazed forage in horse nutrition and the increasing role of horses in the management of grasslands in Europe. Large differences in body size can be found in adult horses of different breeds and intake rates are commonly affected by body size and mouth morphology in mammalian herbivores. This study describes the functional response of horses using, for the first time, natural swards offering a wide range of biomass (from 82 to 513 gDM m-2, i.e. heights from 3 cm to 63 cm) and varying in quality (NDF: 53-68%), and animals of different body sizes (ponies: 253 kg, saddle horses: 602 kg, heavy horses: 953 kg). Instantaneous intake rate was the product of bite size measurements on sward trays and bite rate values obtained on the same swards while horses were grazing at pasture. Using the Spalinger and Hobbs [Spalinger, D.E., Hobbs, N.T., 1992. Mechanisms of foraging in mammalian herbivores: new model of functional response. Am. Nat. 140, 325-347] model developed for mammalian herbivores, we found that Type II functional responses (i.e. asymptotic curve) provided a satisfactory fit to the intake rate by horses of contrasting body sizes on the range of biomass tested. As has been found in ruminants, handling time (i.e. the time needed to crop and to process a mouthful) increased linearly with bite size in the three sizes of horses. The maximum processing rate increased with body size, indicating that smaller horses are more constrained when bite size increases. Taking into account the fibrousness of swards did not improve the estimation of handling time which means that horses were relatively unaffected by the range of fibrousness in our study.
Keywords: Biomass; Body size; Functional response; Grazing; Horses; Sward quality

Lin Wei, Lester O. Pordesimo, C. Igathinathane, William D. Batchelor, Process engineering evaluation of ethanol production from wood through bioprocessing and chemical catalysis, Biomass and Bioenergy, Volume 33, Issue 2, February 2009, Pages 255-266, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2008.05.017.

(http://www.sciencedirect.com/science/article/B6V22-4TB0V1F-1/2/3354449a1ec46eabe2271c31759e16af)
Abstract:
Ethanol produced from lignocellulosic biomass through a number of conversion pathways presents a more viable alternative to fossil fuels because non-food feedstocks are used. The approaches for ethanol production from biomass, such as wood, can be classified into three general pathways: hydrolysis fermentation (hydrolysis followed by fermentation of the sugars), gasification biosynthesis (gasification followed by biosynthesis to ethanol), and gasification chemical synthesis (gasification followed by catalytic synthesis to ethanol). To compare performance of the three pathways, a black-box system model was utilized with relevant assumptions to analyze their mass and energy conversion efficiencies. Their processing times were also estimated. A comprehensive comparison of the modeling results showed that from a process engineering standpoint, the feasibility of the biomass refining pathways ordered from high to low is gasification chemical synthesis, hydrolysis fermentation, then gasification biosynthesis. Calculations of a performance index, a singular number incorporating the major input and output and processing time of a pathway that was defined, also supported this order.
Keywords: Ethanol; Biomass conversion; Wood; Pathway, gasification; Fermentation, Hydrolysis; Catalytic synthesis

P. Hogy, A. Fangmeier, Atmospheric CO2 enrichment affects potatoes: 2. Tuber quality traits, European Journal of Agronomy, Volume 30, Issue 2, February 2009, Pages 85-94, ISSN 1161-0301, DOI: 10.1016/j.eja.2008.07.006.
(http://www.sciencedirect.com/science/article/B6T67-4TCGM8T-1/2/28562d5ff75adbca7b42f45e9b171733)
Abstract:
Although quality of potato tubers is an important topic with regard to food and industrial processing, the consequences of future atmospheric carbon dioxide (CO2) enrichment on related attributes are still unclear. Effects of elevated CO2 concentrations on yield quality of potato (Solanum tuberosum L. cv. Bintje) were thus investigated in two full growing seasons under 380, 550 or 680 [mu]mol mol-1 CO2 in open-top chambers (OTCs). When averaged over both years, tuber malformation was increased by 62.8% as CO2 levels raised from 380 to 550 [mu]mol mol-1, resulting in a negative impact on tuber quality. In contrast, elevated CO2 caused lower tuber greening and therefore enhanced tuber market value. Physical potato quality remained largely unchanged, except for the positive relationships between CO2 and dry matter content, resulting in higher tuber quality for industrial processing. Significant relationships were also observed between CO2 concentrations and several chemical quality parameters. The concentrations of glucose, fructose and total reducing carbohydrates were positively related to CO2 levels, which decrease tuber quality due to the higher risk for browning and generation of acrylamide of fried products. The concentrations of protein, potassium, and as a trend of calcium, were negatively related to CO2 enrichment, suggesting adverse impacts on tuber quality for human nutrition and aesthetic and sensory quality during processing. Significant negative relationships between CO2 treatments and concentrations of leucine, phenylalanine and methionine, and as a trend for di-tyrosine, histidine and aspartic acid, were also indicated, which may decrease nutrition quality of potatoes because of the reduction in physiologically valuable amino acids. With regard to organic acids, CO2-related alterations were restricted to lower concentrations of citric acid. This may reduce the processing quality of potato tuber, as there is a higher risk of discoloration, and at the same time improve quality aspects related to taste. In addition, the experiments indicated negative relationships between CO2 concentrations and total glycoalkaloids and [alpha]-chaconine, which may have negative effects on the taste of potato at low concentration of glycoalkaloids of the present study. Concomitantly, the CO2-induced decrease in glykoalkaloids may be regarded as an improvement of quality in terms of lower toxicological potential. CO2 enrichment may thus cause

substantial impacts, both positive and negative, on tuber quality of potato with regard to commercial value, industrial processing and consumer nutrition and health in the future. Currently, no clear evidence exists whether CO2-induced beneficial changes will outweigh adverse effects on tuber quality.
Keywords: CO2 enrichment; OTC; Solanum tuberosum L.; Potato; Tuber quality

C. Bueno-Solano, J. Lopez-Cervantes, O.N. Campas-Baypoli, R. Lauterio-Garcia, N.P. Adan-Bante, D.I. Sanchez-Machado, Chemical and biological characteristics of protein hydrolysates from fermented shrimp by-products, Food Chemistry, Volume 112, Issue 3, 1 February 2009, Pages 671-675, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.06.029.
(http://www.sciencedirect.com/science/article/B6T6R-4STGRXT-3/2/26e2be9ebfac6853d0bdedc7d3a5b83a)
Abstract:
Protein hydrolysates were prepared through lactic acid fermentation of the inedible portions of shrimp (cephalothorax and exoskeleton), the by-products of shrimp processing operations. The protein-rich liquid hydrolysate was further processed into a concentrated paste via vacuum evaporation at 80 [degree sign]C or was also processed into a dry powder using a spray drying method at 180 [degree sign]C/140 [degree sign]C (inlet/outlet temp). The laboratory compared the composition of the three forms of shrimp protein hydrolysates. The protein and ash content of the hydrolysates ranged from 8.43 +/- 0.22 to 46.73 +/- 1.29 and 2.03 +/- 0.52 to 8.25 +/- 0.14 g/100 g of wet weight. All the samples were analyzed for fifteen amino acids; the powder form was analyzed for colour, microbial content, and for heavy metal occurrence. The shrimp by-products were successfully converted into micro-nutrient by-products rich in amino acids for potential recommendations in the supplementation of animal and human diets.
Keywords: Protein hydrolysates; Shrimp by-products; Amino acids; Food analysis; Lactic acid fermentation

Anna Jofre, Teresa Aymerich, Margarita Garriga, Improvement of the food safety of low acid fermented sausages by enterocins A and B and high pressure, Food Control, Volume 20, Issue 2, February 2009, Pages 179-184, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.04.001.
(http://www.sciencedirect.com/science/article/B6T6S-4S8TB6F-1/2/4f8f6a8e8d5ab527a5bcb80b311426b7)
Abstract:
Fermented sausage technology involves a sequence of hurdles that appear along the ripening process. A wide variety of fermented sausages are manufactured worldwide based on the concept of reduction of pH and/or water activity. In low acid fermented sausages the absence of high acidification can be balanced by the application of additional hurdles such as bacteriocins and/or high hydrostatic pressure (HHP). The addition of enterocins A and B to raw-sausages spiked with 3 log CFU/g of Salmonella, Listeria monocytogenes and Staphylococcus aureus showed an immediate reduction in the counts of L. monocytogenes due to the enterocins, while Salmonella was more affected by the endogenous hurdles associated with the ripening process. The application of an HHP treatment of 400 MPa at the end of ripening produced an immediate reduction in the counts of Salmonella but not in L. monocytogenes or S. aureus. During storage of the low acid sausages (fuets) at room temperature and at 7 [degree sign]C, counts of Salmonella and L. monocytogenes progressively decreased in all batches although the decrease was faster in the pressurized ones stored at room temperature. At the end of storage, Salmonella was <1 log CFU/g in all the batches but only the combination of enterocins and HHP could reduce the counts of L. monocytogenes to this level. Neither the ripening process, the enterocins nor the pressurization could control the levels of S. aureus.
Keywords: Enterocin; Food-borne pathogens; High pressure processing; Fermented sausages; Storage temperature

Justin O'Grady, Margaret Ruttledge, Sara Sedano-Balbas, Terry J. Smith, Thomas Barry, Majella Maher, Rapid detection of Listeria monocytogenes in food using culture enrichment combined with real-time PCR, Food Microbiology, Volume 26, Issue 1, February 2009, Pages 4-7, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.08.009.
(http://www.sciencedirect.com/science/article/B6WFP-4TF7C8T-1/2/8f892ed72bb2b013d8dab0b31be10337)
Abstract:
A rapid method for the detection of Listeria monocytogenes in foods combining culture enrichment and real-time PCR was compared to the ISO 11290-1 standard method. The culture enrichment component of the rapid method is based on the ISO standard and includes 24 h incubation in half-Fraser broth, 4 h incubation in Fraser broth followed by DNA extraction and real-time PCR detection of the ssrA gene of L. monocytogenes. An internal amplification control, which is co-amplified with the same primers as the L. monocytogenes DNA, was also included in the assay. The method has a limit of detection of 1-5 CFU/25 g food sample and can be performed in 2 working days compared to up to 7 days for the ISO standard. A variety of food samples from retail outlets and food processing plants (n = 175) and controls (n = 31) were tested using rapid and conventional methods. The rapid method was 99.44% specific, 96.15% sensitive and 99.03% accurate when compared to the standard method. This method has the potential to be used as an alternative to the standard method for food quality assurance providing rapid detection of L. monocytogenes in food.
Keywords: Listeria monocytogenes; Real-time PCR; Detection; Food; ssrA gene/tmRNA; Internal amplification control

S.K. Sagoo, C.L. Little, M. Greenwood, V. Mithani, K.A. Grant, J. McLauchlin, E. de Pinna, E.J. Threlfall, Assessment of the microbiological safety of dried spices and herbs from production and retail premises in the United Kingdom, Food Microbiology, Volume 26, Issue 1, February 2009, Pages 39-43, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.07.005.
(http://www.sciencedirect.com/science/article/B6WFP-4T8HHDC-4/2/205f344c8702548edad4b23ac9d779d2)
Abstract:
A study of dried spices and herbs from retail and production premises to determine the microbiological status of such products was undertaken in the UK during 2004. According to EC Recommendation 2004/24/EC and European Spice Association specifications, 96% of 2833 retail samples and 92% of 132 production batches were of satisfactory/acceptable quality. Salmonella spp. were detected in 1.5% and 1.1% of dried spices and herbs sampled at production and retail, respectively. Overall, 3.0% of herbs and spices contained high counts of Bacillus cereus (1%, >=105 cfu g-1), Clostridium perfringens (0.4%, >=103 cfu g-1) and/or Escherichia coli (2.1%, >=102 cfu g-1). Ninety percent of samples examined were recorded as being `ready-to-use', 96% of which were of satisfactory/acceptable quality. The potential public health risk of using spices and herbs as an addition to ready-to-eat foods that potentially undergo no further processing is therefore highlighted in this study. Prevention of microbial contamination in dried herbs and spices lies in the application of good hygiene practices during growing, harvesting and processing from farm to fork, and effective decontamination. In addition, the importance of correct food handling practices and usage of herbs and spices by end users cannot be overemphasised.
Keywords: Spices; Salmonella; Bacillus cereus; Clostridium perfringens; Food safety

Willem H. Groenewald, Pieter A. Gouws, R. Corli Witthuhn, Isolation, identification and typification of Alicyclobacillus acidoterrestris and Alicyclobacillus acidocaldarius strains from orchard soil and the fruit processing environment in South Africa, Food Microbiology, Volume 26, Issue 1, February 2009, Pages 71-76, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.07.008.

(http://www.sciencedirect.com/science/article/B6WFP-4T8HHDC-3/2/aa942cd21cededb9cdc2ea21bd2ce467)
Abstract:
Alicyclobacillus acidoterrestris and Alicyclobacillus acidocaldarius are thermo-acidophilic, non-pathogenic, spore-forming bacteria that can survive the typical heat processing of fruit juices and concentrates. Bacterial endospores then germinate, grow and cause spoilage of acid food products. Species of Alicyclobacillus were isolated from orchard soil and a fruit concentrate production factory in South Africa. Preliminary identification of the isolates was based on morphological, biochemical and physiological properties. Identification at species level was done by PCR amplification using genus-specific primers and 16S ribosomal RNA (rRNA) gene sequencing. The majority of isolates belonged to the species A. acidoterrestris, but A. acidocaldarius was also isolated and identified. As far as we could determine, this is the first report of the isolation of A. acidoterrestris from wash water and soil outside a fruit processing plant, as well as the isolation of A. acidocaldarius from vinigar flies. The genotypic relatedness between strains of A. acidoterrestris and between strains of A. acidocaldarius was determined by RAPD-PCR. Sixteen isolates identified as A. acidoterrestris grouped into four clusters based on RAPD-PCR banding patterns, suggesting that they belong to at least four genotypic groups. Three isolateT:/PGN/ELSEVIER/YFMIC/web/00001155/s identified as A. acidocaldarius gave three unique banding patterns.
Keywords: Alicyclobacillus; Fruit processing environment; 16S rRNA gene sequence; RAPD-PCR

J.P. Rowe, L.V. Ogden, O.A. Pike, F.M. Steele, M.L. Dunn, Effect of end-user preparation methods on vitamin content of fortified humanitarian food-aid commodities, Journal of Food Composition and Analysis, Volume 22, Issue 1, February 2009, Pages 33-37, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.09.004.
(http://www.sciencedirect.com/science/article/B6WJH-4TVHSKG-2/2/81e55e26736d582ef4e62d3aca99fbe4)
Abstract:
The effect of cooking on vitamin stability in common fortified food-aid commodities was evaluated: corn-soy blend (CSB), cornmeal (CM), soy-fortified bulgur (SFB), and vegetable oil (VO). Thin CSB porridge, thick CM and SFB porridges, and dumplings fried in VO were prepared using average preparation parameters determined from the data collected in the field. Vitamin levels in pre- and post-cook samples were tested. In CSB thin porridge, vitamins C and E showed cooking losses of 53% and 18%, respectively; thiamin, folic acid, riboflavin, pantothenic acid, pyridoxine HCl, vitamin A, and vitamin B12 showed no significant losses. In CM thick porridge, thiamin, folic acid, riboflavin, and vitamin A showed no significant changes during cooking. In SFB, vitamin A was reduced by 33%, while thiamin, folic acid, and riboflavin showed no significant changes during cooking. In VO that was used to prepare dumplings, vitamin A losses of 6% occurred after one frying cycle. Vitamin A content of the dumplings, however, increased significantly during frying. With the exception of vitamins C and E in CSB and vitamin A in SFB and VO, typical cooking had little effect on vitamin stability.
Keywords: Corn-soy blend; Cornmeal; Soy-fortified bulgur; Vegetable oil; Vitamin stability; Vitamin retention after processing; Micronutrient deficiency; Humanitarian food aid; Fortified food aid; Food composition

Mutlu Pilavtepe-Celik, Sencer Buzrul, Hami Alpas, Faruk Bozoglu, Development of a new mathematical model for inactivation of Escherichia coli O157:H7 and Staphylococcus aureus by high hydrostatic pressure in carrot juice and peptone water, Journal of Food Engineering, Volume 90, Issue 3, February 2009, Pages 388-394, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.06.043.

(http://www.sciencedirect.com/science/article/B6T8J-4T0WJN9-3/2/355ced5de4e31e0fb4dea5248853ec8c)
Abstract:
Survival data of Escherichia coli O157:H7 933 and Staphylococcus aureus 485 in carrot juice and peptone water were collected in a range of pressure levels between 200 and 400 MPa at 40 [degree sign]C. A mathematical approach combining the primary and secondary models (Weibull and first-order models as the primary model and two empirical equations as the secondary model) was proposed to estimate the microbial parameters using nonlinear least squares procedure in one step, resulting a single equation. Although not perfectly matched with the survival data, the proposed model produced good fits. Better fits were observed for S. aureus than for E. coli. Simulations of 5log10 reductions of both pathogens indicated that carrot juice had a protective effect on E. coli whereas it had a sensitizing effect on S. aureus. The development of such mathematical models would be very beneficial to the food industry by developing safe processing conditions for HHP processing of foods.
Keywords: High hydrostatic pressure; Escherichia coli O157:H7; Staphylococcus aureus 485; Carrot juice; Predictive microbiology

Stephen R.L. Werner, Jim R. Jones, Anthony H.J. Paterson, Richard H. Archer, David L. Pearce, Droplet impact and spreading on lecithinated anhydrous milkfat surfaces, Journal of Food Engineering, Volume 90, Issue 4, February 2009, Pages 525-530, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.07.020.
(http://www.sciencedirect.com/science/article/B6T8J-4T3VPYW-4/2/cbafa8fc6e2b816da9a26e86bca84500)
Abstract:
Droplet impact and spreading is an important phenomenon that contributes to the quality of the coatings applied to food powders in air-suspension coating operations. This work investigates the dynamics of spreading 2.8 mm droplets containing maltodextrin DE5 at 20 wt% and 40 wt% in water, at an impact velocity of 2.6 m s-1. The impact surface was anhydrous milkfat which was treated with three food-grade lecithin products to alter the surface hydrophobicity. Results were analysed with respect to the maximum spread diameter achieved ~2 ms after impact and the final spread diameter achieved 2-4 s later. Lecithination of the surface did not affect the maximum spread diameter but resulted in greater final spread diameters. This is because lecithination reduces the equilibrium contact angle of the droplet on the surface. However, addition of lecithin to the droplet produced the same final spread diameters regardless of the surface treatment. This has the processing advantage where only the coating formulation need be manipulated to obtain the best spreading characteristics and avoid the extra processing step to modify the chemical characteristics of the substrate surface.
Keywords: Drop impact; Spreading; Hydrophobic; Surface tension; Formulation

Hely Tuorila, Erminio Monteleone, Sensory food science in the changing society: Opportunities, needs, and challenges, Trends in Food Science & Technology, Volume 20, Issue 2, February 2009, Pages 54-62, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.10.007.
(http://www.sciencedirect.com/science/article/B6VHY-4TY9MN6-1/2/f7257105d3353ced0f377b78b53cab83)
Abstract:
Sensory food science has evolved from the need for scientifically sound and systematic sensory evaluation of foods. Capitalising on its multidisciplinary nature, it has to accommodate to many research traditions and interests. In the past 15-20 years the field has made substantial progress in developing new methods and approaches and in advancing our understanding of consumer responses to foods. Sensory food science can contribute to understanding responses of different consumer segments to emerging trends in food production, processing and consumption.

Favourable progress of the field requires proper university training programmes, funding for basic research, and multidisciplinary collaboration.

Guylene Aurore, Berthe Parfait, Louis Fahrasmane, Bananas, raw materials for making processed food products, Trends in Food Science & Technology, Volume 20, Issue 2, February 2009, Pages 78-91, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.10.003.
(http://www.sciencedirect.com/science/article/B6VHY-4TPPDYY-2/2/43acdf265443d3e3009ea4084f2f1b1b)
Abstract:
Musa spp., comprising banana and plantain, are among the world's leading fruit crops. Worldwide, 103 million tonnes were produced in 2004, according to FAO statistics database. Few bananas produced undergo industrial processing. Plantain and unripe banana are consumed cooked, whereas, mature dessert banana is eaten raw. Characterising bananas, their processed products and processed consumption forms, is a key precondition for objective communication on these foodstuffs. This will enable niche markets for this major crop, undifferentiated product flows of which are in competition on the worldwide market, to be structured on an objective qualitative basis.

Shaoyun Wang, Emerging Technologies for Food Processing, edited by Da-Wen Sun, Published by: Elsevier Academic Press, San Diego, CA, USA, 792 pages, 2005, Price GBP 100.00, ISBN: 0-12-676757-2, 978-0-12-676757-5., Trends in Food Science & Technology, Volume 20, Issue 2, February 2009, Pages 105-106, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.005.
(http://www.sciencedirect.com/science/article/B6VHY-4VBDK8C-7/2/3db02ec1e9fe1180f99bed3410428f65)

Janice E. Stuff, Eugenia T. Goh, Stephanie L. Barrera, Melissa L. Bondy, Michele R. Forman, Construction of an N-nitroso database for assessing dietary intake, Journal of Food Composition and Analysis, In Press, Corrected Proof, Available online 28 January 2009, ISSN 0889-1575, DOI: 10.1016/j.jfca.2009.01.008.
(http://www.sciencedirect.com/science/article/B6WJH-4VGF3SV-1/2/2792c5de15b0b6b911f2a78bda34ea94)
Abstract:
Dietary N-nitroso compounds are carcinogens synthesized during food processing from two main classes of precursors, oxides of nitrogen and amines or amides. Quantification of the dietary intake of N-nitroso compounds is significant to human cancers, including those of the stomach and upper gastro-intestinal tract, colon, and brain. Previous studies investigating these cancers primarily used proxy estimates of N-nitroso intake and not a full and complete database. In this report, we describe the development of a database to be used in conjunction with a food frequency questionnaire (FFQ) or 24 h dietary records. Published analytical data for N-nitroso compounds were compiled and evaluated for inclusion in the database. The final database consisted of 23 different N-nitroso compounds for 500 foods from 39 different food subgroups. Next, database foods were matched to foods in a standard FFQ by imputation, or calculated value, or assumed zero. Using the FFQ modified with N-nitroso values, we evaluated the ability to compute N-nitroso intakes for a sample of healthy control subjects of cancer epidemiological studies. N-nitroso content of food items ranged from <0.01 [mu]g/100 g to 142 [mu]g/100 g and the richest sources were sausage, smoked meats, bacon, and luncheon meats. The database is useful to quantify N-nitroso intake for observational and epidemiological studies.
Keywords: N-nitroso compounds; Dietary carcinogens; Food data; Food safety; Food composition database; Food analysis; Food composition

D.B. Haytowitz, L.E. Lemar, P.R. Pehrsson, USDA's Nutrient Databank System - A tool for handling data from diverse sources, Journal of Food Composition and Analysis, In Press, Corrected Proof, Available online 24 January 2009, ISSN 0889-1575, DOI: 10.1016/j.jfca.2009.01.003.
(http://www.sciencedirect.com/science/article/B6WJH-4VFK7VJ-2/2/615dd8ca5ef68bc0fcbcedfeec822f87)
Abstract:
Key features of USDA's Nutrient Databank System (NDBS) allow processing of food composition data from diverse sources, including USDA's National Food and Nutrient Analysis Program, the food industry, scientific literature, and food labels. The Nutrient Data Laboratory (NDL) designed the NDBS as a three-tiered ('Initial', 'Aggregation', and 'Compiled') data management system to facilitate handling of data. Raw data and documentation (data source, sample description, sample handling, and analytical methods) are migrated into the Initial module. NDL scientists compare new data with old values and decide how to combine the initial data into aggregated data. In the Aggregation module, data can be grouped and weighted by parameters such as study, source, and market share. Depending on the type of data, various statistical algorithms are used to generate statistics, such as mean, standard error, number of data points, and error bounds. In the Compiled module, food names are finalized and common measures selected. Nutrient profiles are developed and missing nutrients/food components are imputed according to standardized scientific principles. A formulation application employing linear programming techniques, estimate, formulations for commercial foods and nutrient profiles based on the nutrient content of ingredients and target values derived from label information. A recipe application calculates nutrient profiles based on ingredients and their known proportions, allowing for the application of food yield and nutrient retention factors. The NDBS automatically documents how each value was derived and incorporates quality control checks at all levels. Prior to release, the completed nutrient profiles are reviewed by NDL scientists and, if approved, disseminated. The NDBS brings together a number of stand-alone modules and applications into one integrated system allowing the management of ~7500 food items for up to 140 nutrients/food components. Data points and documentation are managed and maintained in one place, providing an 'audit trail' for each data point. The NDBS contains algorithms to assign confidence codes using NDL's data quality evaluation system. The NDBS permits the annual release of reliable data for a comprehensive set of nutrients/food components for a wide variety of foods on NDL's Web site: http://www.ars.usda.gov/nutrientdata. Through these releases, NDL provides food composition data for researchers, diet and health professionals, and consumers, including the 'What We Eat in America' component of the National Health and Nutrition Examination Survey (NHANES).
Keywords: Food composition; Database; Nutrient data; Food item table; Nutrient value table; Data compilation; USDA Nutrient Databank System; NDBS; Nutrient Data Laboratory; NDL; Dr. Atwater; What We Eat in America; NHANES

Xianming Shi, Xinna Zhu, Biofilm formation and food safety in food industries, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 22 January 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.054.
(http://www.sciencedirect.com/science/article/B6VHY-4VF56SP-3/2/8629dbcad3af1c8dec930e34cde503d2)
Abstract:
Biofilms are a self-protection growth pattern of bacteria, which are different from planktonic cells. They have been of considerable interest in food hygiene since biofilms may contain spoilage and pathogenic bacteria which increases post-processing contamination and risk to public health. In addition, biofilm cells are more resistant to cleaning and disinfection processes in the food industry. Biofilm formation is a complex process in which genetic mechanisms and numerous factors such as the properties of substratum and bacterial cell surfaces are involved. In order to

further understand the intricate mechanisms behind biofilm formation, various techniques including physical, chemical and molecular methods have been used to establish the possible model of biofilm formation in food industry. Therefore, the importance of bacterial biofilms in food safety control and biofilm formation mechanisms will be discussed in this paper. The objective of all efforts is to provide new insights for developing biofilm-free food-processing systems.

Jason Wan, John Coventry, Piotr Swiergon, Peerasak Sanguansri, Cornelis Versteeg, Advances in innovative processing technologies for microbial inactivation and enhancement of food safety - pulsed electric field and low-temperature plasma, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 20 January 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.050.
(http://www.sciencedirect.com/science/article/B6VHY-4VDS8BT-3/2/8918d0e2888704bd8600a89b81a16944)
Abstract:
The need for enhancing microbial food safety and quality, without compromising the nutritional, functional and sensory characteristics of foods, has created an increasing world-wide interest in low-temperature innovative processes for food preservation. In contrast, to the traditional thermal processes, these emerging technologies are predominantly reliant on physical processes, including high hydrostatic pressures, pulsed electric fields and low-temperature plasmas that inactivate microorganisms at ambient or moderately elevated temperatures and short treatment times. The current review presents the latest developments in the two most recent of these technologies, pulsed electric field and low-temperature plasma treatments for food preservation and disinfection of food contact surfaces.
Keywords: text

Filip Tintchev, Uwe Kuhlmann, Hainer Wackerbarth, Stefan Topfl, Volker Heinz, Dietrich Knorr, Peter Hildebrandt, Redox processes in pressurised smoked salmon studied by resonance Raman spectroscopy, Food Chemistry, Volume 112, Issue 2, 15 January 2009, Pages 482-486, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.05.088.
(http://www.sciencedirect.com/science/article/B6T6R-4SNGMB7-8/2/201dc671d6f0a522646f38c5e3aedf43)
Abstract:
Non-thermal food preservation technology is based on the application of high pressures up to 600 MPa. Here we report a resonance Raman (RR) spectroscopic analysis of smoked salmon meat after high pressure processing. High quality spectra, which can be obtained even from packed salmon without spectral interference of the packing foil, allow determining pressure-dependent irreversible changes of the main RR-active components of salmon meat, astaxanthin and myoglobin/haemoglobin. High pressure-treatment causes a decrease of the relative RR intensities of astaxanthin as probed with 514 nm excitation which is in line with a slight attenuation of the originally intense red colour of the salmon meat. 413-nm excited RR spectra indicate a heterogeneous broadening of astaxanthin bands accompanied by the formation of deoxy-myoglobin or deoxy-haemoglobin. The results suggest that pressure-treatment facilitates the oxidative degradation of astaxanthin coupled to the reduction of metmyoglobin (methaemoglobin).
Keywords: Resonance Raman; High pressure; Astaxanthin; Salmon

Mauro Conter, Domenico Paludi, Emanuela Zanardi, Sergio Ghidini, Alberto Vergara, Adriana Ianieri, Characterization of antimicrobial resistance of foodborne Listeria monocytogenes, International Journal of Food Microbiology, Volume 128, Issue 3, 15 January 2009, Pages 497-500, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.10.018.
(http://www.sciencedirect.com/science/article/B6T7K-4TSTY6F-1/2/f181f429799737a68000b430a45835e7)

Abstract:
The objective of this study was to evaluate the susceptibility of 120 Listeria monocytogenes strains isolated from food and food-processing environments to 19 antibiotics currently used in veterinary and human therapy. Susceptibility tests were performed by using the automated VITEK2 system. Apart from penicillin, ampicillin and trimethoprim-sulfamethoxazole, for which clinical breakpoints for Listeria susceptibility testing are defined according to the Clinical and Laboratory Standard Institute (CLSI), in the present study the CLSI criteria for staphylococci were applied. Among the 120 tested strains, 14 (11.7%) displayed resistance to at least one antibiotic. In particular, resistance to one antibiotic was more common than multiple resistance, i.e., 10 (8.3%) isolates were resistant to one antibiotic, 3 (2.5%) to two antibiotics and one (0.8%) to five antibiotics. Resistance to clindamycin was the most common, followed by linezolid, ciprofloxacin, ampicillin and rifampicin, trimethoprim/sulphamethoxazole and, finally, vancomycin and tetracycline.
This study shows that L. monocytogenes strains from food and food-processing environments are susceptible to the antibiotics commonly used in veterinary and human listeriosis treatment. Considering that L. monocytogenes is slowly becoming antibiotic resistant, a continued surveillance of emerging antimicrobial resistance of this pathogen is important to ensure effective treatment of human listeriosis. These data are useful in improving background data on antibiotic resistance of strains isolated from food and food environment.
Keywords: Listeria monocytogenes; Antibiotic resistance; Food; Working environment; MIC; VITEK2

J. Vymazal, The use constructed wetlands with horizontal sub-surface flow for various types of wastewater, Ecological Engineering, Volume 35, Issue 1, 8 January 2009, Pages 1-17, ISSN 0925-8574, DOI: 10.1016/j.ecoleng.2008.08.016.
(http://www.sciencedirect.com/science/article/B6VFB-4TTM32K-1/2/f64aaedd08d767f3972295ee34233383)
Abstract:
Constructed wetlands with horizontal sub-surface flow (HF CWs) have been used for wastewater treatment for more than 30 years. Most HF CWs have been designed to treat municipal or domestic wastewater. Nowadays, municipal HF CWs focus not only on common pollutants but also on special parameters such as pharmaceuticals, endocrine disruptive chemicals or linear alkylbenzensulfonates (LAS). At present, HF CWs are used to treat many other types of wastewater. Industrial applications include wastewaters from oil refineries, chemical factories, pulp and paper production, tannery and textile industries, abattoir, distillery and winery industries. In particular, the use of HF CWs is becoming very common for treatment of food-processing wastewaters (e.g., production and processing of milk, cheese, potatoes, sugar). HF constructed wetlands are also successfully used to treat wastewaters from agriculture (e.g., pig and dairy farms, fish farm effluents) and various runoff waters (agriculture, airports, highway, greenhouses, plant nurseries). HF CWs have also effectively been used to treat landfill leachate. Besides the use as a single unit, HF CWs are also used in combination with other types of constructed wetlands in hybrid systems.
Keywords: Constructed wetlands; Hybrid systems; Municipal wastewater; Nutrients; Organics; Sub-surface flow

Wen-Tien Tsai, Jeng-Hung Chang, Kuo-Jung Hsien, Yuan-Ming Chang, Production of pyrolytic liquids from industrial sewage sludges in an induction-heating reactor, Bioresource Technology, Volume 100, Issue 1, January 2009, Pages 406-412, ISSN 0960-8524, DOI: 10.1016/j.biortech.2008.06.013.
(http://www.sciencedirect.com/science/article/B6V24-4T29WFM-1/2/904a60e7dc9bb59302ca9fdc2f6827ed)
Abstract:

With the application of induction-heating, the pyrolytic experiments have been carried out for three sewage sludges from the food processing factories in an externally heated fixed-bed reactor. The thermochemical characteristics of sludge samples were first analyzed. The results indicated that the calorific value had about 15 MJ/kg on an average, suggesting that it had a potential for biomass energy source. However, its nitrogen concentration was relatively high. From the thermogravimetric analysis (TGA) curves, it showed that the pyrolysis reaction can be almost finished in the temperature range of 450-750 [degree sign]C. The yields of resulting liquid and char products from the pyrolysis of sewage sludge were discussed for examining the effects of pyrolysis temperature (500-800 [degree sign]C), heating rate (200-500 [degree sign]C/min), and holding time (1-8 min). Overall, the variation of yield was not so significant in the experimental conditions for three sewage sludges. All results of the resulting liquid products analyzed by elemental analyzer, pH meter, Karl-Fischer moisture titrator and bomb calorimeter were in consistence with those analyses by FTIR spectroscopy. Furthermore, the pyrolysis liquid products contained large amounts of water (>73% by weight) mostly derived from the bound water in the biosludge feedstocks and the condensation reactions during the pyrolysis reaction, and fewer contents of oxygenated hydrocarbons composing of carbonyl and nitrogen-containing groups, resulting in low pH and low calorific values.
Keywords: Sewage sludge; Pyrolysis; Chemical characterization; Yield

Yu-Jie Fu, Wei Liu, Yuan-Gang Zu, Xiao-Guang Shi, Zhi-Guo Liu, Gunter Schwarz, Thomas Efferth, Breaking the spores of the fungus Ganoderma lucidum by supercritical CO2, Food Chemistry, Volume 112, Issue 1, 1 January 2009, Pages 71-76, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.05.044.
(http://www.sciencedirect.com/science/article/B6T6R-4SJP7M4-2/2/4dfe979c1701d9d5d297809bd905d6ee)
Abstract:
The hard sporoderm of Ganoderma lucidum spores prevents the release of bioactive components such as polysaccharides which have significant anti-tumour activity. In the present study, supercritical carbon dioxide (SC-CO2) was used for the sporoderm breaking of G. lucidum spores, and polysaccharides were subsequently extracted and determined for evaluating the performances of SC-CO2. The operating parameters were optimized by orthogonal array design (OAD), and the morphological status of sporoderm was observed by scanning electron microscope (SEM). The optimum operating conditions for SC-CO2 breaking of sporoderm were as follows: pressure 35 MPa, temperature 25 [degree sign]C, time 4 h, and CO2 flow rate 10 kg/h. After SC-CO2 processing, the extraction yield of polysaccharides reached 2.98%, which was 3-fold to that of the intact ones (0.94%). This method is fast, efficient and advanced enough to break the hard sporoderm of G. lucidum, which may provide a scientific reference for the large-scale processing of spores in the pharmaceutical and food industries.
Keywords: Ganoderma lucidum; Polysaccharides; SC-CO2; SEM; Sporoderm breaking

Daniil Sergelidis, Amin Abrahim, Adaptive response of Listeria monocytogenes to heat and its impact on food safety, Food Control, Volume 20, Issue 1, January 2009, Pages 1-10, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.01.006.
(http://www.sciencedirect.com/science/article/B6T6S-4RNJ8MB-3/2/d015a5abfbd8c1aef82afdc6876e8141)
Abstract:
Listeria monocytogenes is an important food associated pathogen because of its relatively high heat resistance and ability to multiply in refrigeration temperatures. Its thermotolerance can be increased when its cells are subjected to heat shock. One- to eight-fold increase of D values of L. monocytogenes have been reported, depending on the heat shock duration, the temperature and

the heating menstrum. This acquisition of heat tolerance is related to the induction of the synthesis of heat shock proteins (HSPs).
The adaptive response of food pathogens has important consequences on the safety of thermally processed foods. It is believed that this is responsible for the frequent occurrence of deviations (tails and shoulders) during heat treatments that are observed in the exponential model of microbial inactivation. These deviations from log-linear kinetic especially encountered under mild heat treatments, mean that prediction of food safety can no longer rely upon D and z values. Adaptive response to heat must be considered when quantifying and modeling microbial inactivation during thermal processing in order to achieve microbiologically safe products without overly conservative heat processes. Therefore a more mechanistic approach is needed for more accurate predictions of thermal inactivation. Prerequisite to this model are thorough studies to understand how L. monocytogenes and other pathogens adapt their cellular physiology to overcome heat and other stresses.
Keywords: Listeria monocytogenes; Heat shock response; Heat shock proteins; Modeling thermal treatment

Jianshe Chen, Food oral processing--A review, Food Hydrocolloids, Volume 23, Issue 1, January 2009, Pages 1-25, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2007.11.013.
(http://www.sciencedirect.com/science/article/B6VP9-4R7RS8H-1/2/5565ab4fe6d16c6ca171a399085fbb96)
Abstract:
Food oral processing is an essential procedure not only for the consumption and digestion of foods but also for the appreciation and pleasure of food texture and food flavour. The consumption of a food inside mouth involves various oral operations, including first bite, chewing and mastication, transportation, bolus formation, swallowing, etc. Exact mechanisms and governing principles of these oral operations are still not fully understood, despite of continuous efforts made by scientists from food, psychology, physiology, dental and clinical studies, and other disciplines. This article reviews recent progresses and literature findings about food processing and transformation in mouth, with particular attention on the physiology and rheology aspects of oral operations. The physiological behaviour of human's oral device is discussed in terms of biting capability, tongue movement, saliva production and incorporation, and swallowing. The complexity of oral processing is analysed in relation to the rheology and mechanical properties of foods. The swallowing and oral clearing process is also examined for its criteria, triggering mechanism, bolus deformation, and the rheology of swallowing.
Keywords: Oral processing; Oral physiology; Food rheology; Food texture; Saliva; First bite; Chewing; Mastication; Bolus; Swallowing

Kingsley K. Agyare, Kwaku Addo, Youling L. Xiong, Emulsifying and foaming properties of transglutaminase-treated wheat gluten hydrolysate as influenced by pH, temperature and salt, Food Hydrocolloids, Volume 23, Issue 1, January 2009, Pages 72-81, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2007.11.012.
(http://www.sciencedirect.com/science/article/B6VP9-4R7J661-1/2/abd99b82293dca7e8aade715f592265c)
Abstract:
Hydrolyzed wheat gluten (GH, 77-85% protein) was prepared by limited hydrolysis with chymotrypsin at 37 [degree sign]C for 4 h (degree of hydrolysis=6.4%) and 15 h (degree of hydrolysis=10.3%). The effect of microbial transglutaminase (MTGase) treatment (55 [degree sign]C for 1 h, or 5 [degree sign]C for 18 h) on the emulsifying and foaming properties of GH was evaluated under selected food processing conditions (pH 4.0 and 6.5, 0 and 0.6 M NaCl, and temperature 20 and 5 [degree sign]C). At pH 4.0 and 0 M NaCl the MTGase treatment substantially increased foaming capacity (FC) of GH compared with their respective control GH

samples, as a result of enhanced peptide adsorption to the air-water interface, but FC was similar for both control and MTGase-treated GH at pH 6.5. In contrast, foam drainage stability (FS) of MTGase-treated GH decreased at pH 4.0, but increased significantly ($P<0.05$) at pH 6.5 when compared with their respective control GH samples. The FC and FS were affected by 0.6 M NaCl in a pH-dependent manner. The MTGase treatments increased emulsion activity index up to 15-fold at pH 6.5, while emulsion stability index was influenced by emulsion temperature and ionic strength conditions. The MTGase-induced changes in functional properties of GH were attributed to pH-dependent solubility changes, the amphiphilic nature of gluten peptides and increased electrostatic repulsion resulting from deamidation.
Keywords: Hydrolyzed wheat gluten; Emulsifying properties; Foaming properties; Microbial transglutaminase

Geetanjali Kaushik, Santosh Satya, S.N. Naik, Food processing a tool to pesticide residue dissipation - A review, Food Research International, Volume 42, Issue 1, January 2009, Pages 26-40, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.09.009.
(http://www.sciencedirect.com/science/article/B6T6V-4THC1BM-3/2/65b13bb20b501f6d31495110b479606b)
Abstract:
Food safety is an area of growing worldwide concern on account of its direct bearing on human health. The presence of harmful pesticide residues in food has caused a great concern among the consumers. Hence, world over to tackle food safety issues, organic farming is being propagated. However, due to several reasons, diffusion and acceptance of this approach in developing countries has been very slow. Therefore, it is important in the transient phase that some pragmatic solution should be developed to tackle this situation of food safety. Food processing treatments such as washing, peeling, canning or cooking lead to a significant reduction of pesticide residues. In this background this paper reviews the common food processing operations along with the degree of residue removal in each process. The processes reviewed include: baking, bread making, dairy product manufacture, drying, thermal processing, fermentation, freezing, infusion, juicing, malting, milling, parboiling, peeling, peeling and cooking, storage, storage and milling, washing, washing and cooking, washing and drying, washing and peeling, washing peeling and juicing and wine making. Extensive literature review demonstrates that in most cases processing leads to large reductions in residue levels in the prepared food, particularly through washing, peeling and cooking operations.
Keywords: Pesticide residue; Transient; Processing; Review; Dissipation

C. Igathinathane, L.O. Pordesimo, W.D. Batchelor, Major orthogonal dimensions measurement of food grains by machine vision using ImageJ, Food Research International, Volume 42, Issue 1, January 2009, Pages 76-84, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.08.013.
(http://www.sciencedirect.com/science/article/B6T6V-4TCHKHC-1/2/80d5c3aa741d643b0a49caade76dd8e0)
Abstract:
A machine vision ImageJ plugin was developed in Java for orthogonal length and width determination of singulated particles from digital images. A flatbed scanner obtained the digital images of particulate samples. The 'pixel-march' method, which compared pixel colors to determine object boundaries for dimensional measurements, utilized only the ImageJ fitted-ellipse centroid coordinates and major axis inclination. The pixel-march started from objects centroid and proceeded along the fitted-ellipses' major and minor axes for boundary identification. Actual dimensions of selected reference particles measured using digital calipers validated the plugin. The plugin was applied to measure orthogonal dimensions of eight types of food grains. The plugin has overall accuracy greater than 96.6%, computation speed of 254 +/- 125 particles/s, handles all shapes and particle orientations, makes repeatable measurements, and is economical.

Applications of developed plugin may include routine laboratory dimensional measurements, physical dimensional characteristics, size based grading, and sieve analysis simulation for particle size distribution.
Keywords: Machine vision; Food grain; Dimension; Image processing; Physical property

C.M. Rosell, E. Santos, C. Collar, Physico-chemical properties of commercial fibres from different sources: A comparative approach, Food Research International, Volume 42, Issue 1, January 2009, Pages 176-184, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.10.003.
(http://www.sciencedirect.com/science/article/B6T6V-4TRCY9P-2/2/6a674c042dc2273a5d86df702af3d5d4)
Abstract:
The lower intake of fibre and fibre-containing foods has refocused the food industry on the benefits of incorporating different fibres in the foodstuff. Nowadays, a whole range of fibres are available in the market, but sometimes a good choice becomes complicated due to their varied physico-chemical properties. In order to give some light when selecting fibres, a comparative study regarding some physical properties of commercial fibres from different sources is presented, with a view to increasing their use in food products, namely bakery products. Commercial fibres included in this study were hydroxypropylmethylcellulose, cellulose, locust bean gum, guar gum, inulin, galactooligosaccharides, oat and wheat fibres, and fibres extracted from apple and bamboo. Particle size distribution (PSD) of the dry commercial fibres ranged from around 10 to 334 [mu]m; moreover PSD in wet (water and ethanol) form was also determined to have precise information about their behaviour when processing. Cereal fibres (oat 600 and wheat) exhibited the highest values for hydration properties (swelling, water holding and water binding capacity). Only the hydrocolloids (HPMC, locust bean gum and guar gum), with the exception of cellulose, yielded highly viscous solutions during the heating-cooling cycle; moreover oat 600 and apple fibre developed viscous solutions after cooling. HPMC, locust bean gum and guar gum significantly augmented the four SRC values, thus those hydrocolloids affected the relative contributions to water absorption of proteins, carbohydrates, damaged starch and pentosans. Fibre sources and degree of replacement significantly affected the SRC values for the four solvents in all the fibre groups, with the exception of lactic acid SRC in the case of cereal fibres. Differences in fibres effect on wheat flour quality can be easily detected by assessing solvent retention capacity, which can give information on the end use functionality of the wheat flour.
Keywords: Fibres; Physico-chemical properties; Hydration; Particle size; Viscosity

Pham Van Hung, Tomoko Maeda, Kazutaka Miyatake, Naofumi Morita, Total phenolic compounds and antioxidant capacity of wheat graded flours by polishing method, Food Research International, Volume 42, Issue 1, January 2009, Pages 185-190, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.10.005.
(http://www.sciencedirect.com/science/article/B6T6V-4TT33RD-1/2/3a30a5f62f8723a145384214bd4c158b)
Abstract:
The graded flour fractions, which were milled from whole wheat grain from outer to inner parts without removal of germ and bran, are rich in dietary fibers and minerals, the sources of nutrition for human beings. In this study, the whole waxy wheat was milled into five fractions using the gradual milling method and the phenolic contents and antioxidant capacity of these flours were investigated. The total phenolic and flavonoid contents of free and bound phenolic extracts gradually increased in the order from the inner to the outer fractions. The flours milled from the outer parts of grain contained significantly higher amount of phenolics and exhibited significantly higher antioxidant capacity than did the whole grain. Likewise, the inner flour fractions milled from mostly endosperm part had significantly higher amount of phenolics and exhibited significantly higher antioxidant capacity than did the white flour, which was milled by a conventional milling

method. Thus, the graded flours from whole waxy wheat should be encouraged to be used for processing whole-grain foods to improve both qualities of end-use products and health benefits.
Keywords: Waxy wheat; Phenolic compound; Antioxidant activity; Gradual milling

A.L.K. Faller, E. Fialho, The antioxidant capacity and polyphenol content of organic and conventional retail vegetables after domestic cooking, Food Research International, Volume 42, Issue 1, January 2009, Pages 210-215, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.10.009.
(http://www.sciencedirect.com/science/article/B6T6V-4TVJ3JG-2/2/0b62000656f45b63c380f2d189ce76e9)
Abstract:
Vegetable consumption is associated with health benefits. Organic foods are thought to have higher contents of antioxidant substances. The objective of this work is to quantify soluble and hydrolyzable polyphenols, ascorbic acid, and the antioxidant capacity of fresh conventional and organic retail vegetables (potato, carrot, onion, broccoli, and white cabbage) while evaluating the effect of boiling, microwaving, and steaming on these parameters. The recovery rate for soluble and hydrolyzable polyphenols was variable according to the vegetable analyzed. However, soluble polyphenols resulted in lower recovery rates than did hydrolyzable phenolics after cooking. Organic vegetables showed higher sensitivity to heat processing than did conventionally grown vegetables. In general, cooking was found to lead to reductions in the antioxidant capacity for most vegetables, with small differences between the cooking methods applied. Even with the alterations in their content, polyphenols showed a positive correlation with antioxidant capacity in raw and cooked vegetables from both types of agriculture.
Keywords: Polyphenol; Antioxidant capacity; Organic; Vegetables; Cooking

Ramesh Y. Avula, Heather M. Nelson, Rakesh K. Singh, Recycling of poultry process wastewater by ultrafiltration, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 1-8, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.08.005.
(http://www.sciencedirect.com/science/article/B6W6D-4TCHKKR-1/2/76d997ed40db7256c4a84b0b525d7ee1)
Abstract:
Poultry processing plants use relatively high amount of water with an average consumption of 26.5 L/bird during primary and secondary processing of live birds to meat. The used water contains proteins, fats, carbohydrates from meat, blood, skin and feathers, resulting in much higher biological oxygen demand (BOD) and chemical oxygen demand (COD). Hence the processors are required to remove majority of the soluble and particulate matter in the wastewater prior to discharge from the plant. Treatments for poultry wastewater include screening, diatomaceous earth filtration, ozonation, and chlorine dioxide. Food safety and inspection service regulations allow reconditioned water to replace potable water in prescribed ratios. Recycling of poultry wastewater by ultrafiltration improves the quality of recycled water and provides solution to water resource limitations. Ultrafiltration is basically a pressure-driven process that separates on the basis of molecular diameter. Membrane bioreactors (MBR) that integrate biological degradation of waste products with membrane filtration are also quite effective in removing organic and inorganic contaminants as well as biological entities from wastewater. Value added products like crude proteins could be separated through ultrafiltration from poultry wastewater, subsequently reducing the chemical oxygen demand. Ongoing research in membrane separation techniques involves exploration of new membrane materials and of new module design configurations to address issues of membrane fouling and treatment of waste streams containing high suspended solids or viscous wastes.Industrial relevance
Poultry processing plants use large volumes of water at different stages of the process due to set policies regarding the pathogen reduction requirements in the broiler meat. Recovery of process wastewater benefits the plant by reducing fresh water demand, wastewater volume and energy

consumption. Microbial safety is the primary concern in reconditioning of process wastewater. Proteins and fats which come from carcass debris and the blood are the major pollutants in the wastewater. These materials are of high nutritional value and should be recovered. The proteins and fats are difficult to harvest by conventional procedures. From an environmental and economic point of view, ultrafiltration is an efficient technique to recondition wastewater and to recover proteins and fats from it. Importantly, this technology addressed the water quantity and quality issues that have been raised in this industry by reducing primary water use and electrical energy. Though the capital costs of ultrafiltration are higher, their life cycle costs are comparable with conventional treatments. Further, foot print of ultrafiltration could be 30-50% of conventional filters with less consumption of chemicals. Hence this paper focuses upon the potential for the use of ultrafiltration membrane processing for recycling poultry process wastewater and recovery of value added products.
Keywords: Ultrafiltration; Poultry wastewater; Reconditioning; Flux

Ankit Patras, Nigel Brunton, Sara Da Pieve, Francis Butler, Gerard Downey, Effect of thermal and high pressure processing on antioxidant activity and instrumental colour of tomato and carrot purees, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 16-22, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.09.008.
(http://www.sciencedirect.com/science/article/B6W6D-4TS6SNB-1/2/fc0ab9cec4ccf7fe4563c0ca76b4effa)
Abstract:
Total antioxidant activity, levels of bio-active compound groups and instrumental colour of tomato and carrot puree subjected to high pressure treatment (400-600 MPa/15 min/20 [degree sign]C) and thermal treatments (70 [degree sign]C/2 min) were measured. Antioxidant activity in tomato and carrot puree was significantly higher ($p < 0.05$) than in untreated or thermally processed samples. High pressure treatments at 600 MPa retained more than 90% of ascorbic acid as compared to thermal processing in tomato purees. Heat treatments caused a rapid decrease in ascorbic acid ($p < 0.05$). Phenolic contents were in general un-affected by thermal or high pressure treatments. Colour parameters were significantly affected ($p < 0.05$) by thermal and high pressure processing. Principal component analysis (PCA) revealed that the first two components represented 97% and 92% of the total variability in instrumental colour parameters with respect to processing for tomatoes and carrots respectively.Industrial relevance
This research paper provides scientific evidence of the potential benefits of high pressure processing in comparison to thermal treatments in retaining important bioactive compounds. Antioxidant activity (ARP), ascorbic acid, and carotenoids after exposure to high pressure treatments (400-600 MPa) were well retained. Our results also show that redness and colour intensity of purees were better preserved by high pressure processing than conventional thermal treatment. It would appear from a nutritional prospective, high pressure processing is an excellent food processing technology which has the potential to retain compounds with health properties in foods. Therefore high pressure processed foods could be sold at a premium over their thermally processed counterparts as they will have retained their fresh-like properties.
Keywords: High pressure processing; Tomato; Carrot; Puree; Antioxidant activity; PCA

Luis Miguel Rodriguez-Alcala, Federico Harte, Javier Fontecha, Fatty acid profile and CLA isomers content of cow, ewe and goat milks processed by high pressure homogenization, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 32-36, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.10.003.
(http://www.sciencedirect.com/science/article/B6W6D-4TT9GK0-1/2/2cf1465c3ed1974aaee06bf1fb18a24a)
Abstract:

High pressure homogenization (HPH) is a novel technology that promotes fat globule size reduction and microbial inactivation, but little research exists on the fate of milk fat lipids. This work studied the effect of HPH (0-350 MPa) of raw cow, goat and ewe milks on the fatty acid total content and profile to elucidate whether this technology has a major impact on the lipid fraction of milk and especially on CLA isomers. Fatty acids in processed milks were determined by GC-FID and CLA isomers by Ag+-HPLC.
Our results indicate that the total amount of fat extracted from the milk samples decreased as the homogenization pressure increased, whereas no significant differences were found in the fatty acid composition, especially in the PUFA and CLA isomers profile of raw milk treated by HPH process up to 350 MPa.Industrial relevance
The absent of significant modifications of the fatty acids content and CLA isomers profile in milk by using high-pressure homogenization is relevant in the development of nonthermal technologies able to pasteurize/sterilize foods, without the organoleptic, functional, and chemical alterations associated to thermal processing.
Keywords: High pressure homogenization; Conjugated linoleic acid; Goats; Cows; Ewes milk; Fatty acids

Hua-Feng Zhang, Xiao-Hua Yang, Li-Dong Zhao, Ying Wang, Ultrasonic-assisted extraction of epimedin C from fresh leaves of Epimedium and extraction mechanism, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 54-60, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.09.007.
(http://www.sciencedirect.com/science/article/B6W6D-4TN0KX9-1/2/59733187d8ca9c01a682ec4f4cd8d4f8)
Abstract:
Epimedin C is an important component of Epimedium with many beneficial functions to human health. In this study, the feasibility of the extraction of epimedin C from fresh leaves of Epimedium using ultrasonic probe system was demonstrated. The high extraction yield of epimedin C was obtained under an optimum extraction condition: extraction temperature of 50 [degree sign]C, methanol concentration 60% (v/v), ratio of liquor to solid 30 mL g- 1, and ultrasonication time 15 min. Scanning electron micrographs and transmission electron micrographs revealed that ultrasound could result in the disruptions of leaf tissues and cell walls, which enhanced the mass transfer of the solvents into the leaf materials and the soluble constituents into the solvents. Compared with traditional Soxhlet extraction method, ultrasonic-assisted extraction reduced extraction time, extraction temperature and solvent consumption, as well as achieved the similar recovery of epimedin C.Industrial relevance
Epimedin C is considered one of the most important flavonoids with significant bioactivities in the famous medicinal plant, Epimedium. It shows great potential for becoming a nutraceutical in functional foods or a phytopharmaceutical for preventing and treating some serious and fatal illnesses. In this study, ultrasonic-assisted extraction of epimedin C directly from fresh Epimedium leaves was optimized for further large-scale industrial processing for the first time, and the extraction mechanism was discussed.
Keywords: Ultrasonic-assisted extraction; Fresh leaves; Epimedin C; Epimedium; Extraction mechanism

B.K. Tiwari, C.P. O'Donnell, K. Muthukumarappan, P.J. Cullen, Anthocyanin and colour degradation in ozone treated blackberry juice, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 70-75, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.08.002.
(http://www.sciencedirect.com/science/article/B6W6D-4T84K3G-1/2/cc43fe7c3f14d2b282364313be37e61e)
Abstract:

Response surface methodology (RSM) was used to investigate the effects of ozone concentration (%w/w) and treatment time (min) on the anthocyanin content and colour of fresh blackberry juice. RSM methodology based on a two factor five level central composite design was employed with control variables of ozone concentration (0 to 7.8%w/w) and treatment time (0 to 10 min) at a constant gas flow rate. Predicted models were found to be significant ($p < 0.001$) with regression coefficients (R2) of 0.89, 0.82, 0.95, 0.86 and 0.97 for L, a, b, TCD and anthocyanin content respectively. Ozone concentration and treatment time were found to be critical factors influencing both anthocyanin and colour degradation. This study demonstrated that response surface methodology can be employed to model colour and anthocyanin degradation of ozonated blackberry juice while minimising the number of experiments required.Industrial relevance
In the United States (US) legislation requires fruit juice processors to achieve a 5-log reduction in the numbers of the most resistant pathogens in their finished products. Consequently a number of commercial fruit juice processors in the US started to employ ozone for fruit juice pasteurisation. Ozonation was approved by the FDA in 2001 as a direct additive to food. The FDA issued industry guidelines for fruit juice processing with ozone [FDA, (2004). FDA Guidance to Industry, 2004: Recommendations to Processors of Apple Juice or Cider on the Use of Ozone for Pathogen Reduction Purposes. Available online http://www.cfsan.fda.gov/~dms/juicgu13.html.], however this report concludes that these guidelines are based upon limited scientific data. This paper investigates the effect of ozone processing on the anthocyanin content and colour of blackberry juice. The results presented demonstrate that the effect of ozonation on the nutritional properties of blackberry juice or juice products containing blackberry should be considered by processors prior to its adoption as a preservation technique.
Keywords: Ozonation; Blackberry; Anthocyanins; Colour

Monika Schreiner, Angelika Krumbein, Inga Mewis, Christian Ulrichs, Susanne Huyskens-Keil, Short-term and moderate UV-B radiation effects on secondary plant metabolism in different organs of nasturtium (Tropaeolum majus L.), Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 93-96, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.10.001.
(http://www.sciencedirect.com/science/article/B6W6D-4TRK0R4-1/2/e1ea4d8ada0aa2cb60228ac7b3882b05)
Abstract:
Glucotropaeolin and total phenolic concentrations were assessed in three different organs (inflorescences, leaves, unripe seeds) of nasturtium (Tropaeolum majus L.), which are consumed as herbal plant products, in order to determine the effect of short-term and moderate UV-B exposure as targeted postharvest stress treatment on the secondary plant metabolism. For this purpose, nasturtium plants were subjected to two UV-B radiation levels: 0.075 and 0.15 W h m- 2. The results clearly demonstrate that the plant response to short-term and moderate UV-B exposure is organ-, plant tissue age-, and phytochemical-specific and that these factors influence a change of secondary metabolism as revealed by the different phytochemical concentration levels elicited.Industrial relevance
In food processing UV treatment is mainly attributed to disinfection. This study examined the feasibility of short-term and moderate UV-B application as emerging technology for enhancing health-promoting phytochemicals in freshly consumed plant products (inflorescences, leaves, unripe seeds) demonstrated by the herbal plant nasturtium. Optimizing phytochemical concentration by targeted postharvest UV-B applications will add health value and subsequently generate new opportunities for growers and processors by achieving the health-oriented food market.
Keywords: Ultraviolet (UV); Glucosinolate; Glucotropaeolin; Total phenolic compounds

R. Simpson, A. Abakarov, Optimal scheduling of canned food plants including simultaneous sterilization, Journal of Food Engineering, Volume 90, Issue 1, January 2009, Pages 53-59, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.06.009.
(http://www.sciencedirect.com/science/article/B6T8J-4SSG4NM-1/2/494ad83aa7688fc0d08a5be2e1ccd774)
Abstract:
Optimization of thermal process scheduling in plants producing canned food is of great interest because canning is a dominant operation within the food processing sector. Batch processing has been widely practiced but scarcely analyzed in the context of plants producing canned food.
The objective of this research study was to solve the problem of optimizing scheduling for the case where given amounts of different canned food products, with specific quality requirements, would be sterilized within a minimum plant operation time.
The proposed solution is based on simultaneous sterilization implementation, using the revisited general method (RGM) procedure for process calculations, and developing a mixed integer linear programming (MILP) model to optimize autoclave scheduling with the purpose of minimizing plant operation time. In order to maximize the output from a specific plant processing different products and container sizes, isolethal processes were identified for various products/containers from which a common set of process conditions could be chosen for simultaneous sterilization of different product lots in the same retort. An example involving the sterilization of 16 different products was solved to illustrate the MILP model developed here. The methodology proposed here is of special relevance to small and medium size canneries, normally processing many different products at the same time.
Keywords: Scheduling; Canned food plants; Simultaneous sterilization; Mixed integer linear programming problem; Isolethal processes

Suqin Shao, Alison M. Duncan, Raymond Yang, Massimo F. Marcone, Istvan Rajcan, Rong Tsao, Tracking isoflavones: From soybean to soy flour, soy protein isolates to functional soy bread, Journal of Functional Foods, Volume 1, Issue 1, January 2009, Pages 119-127, ISSN 1756-4646, DOI: 10.1016/j.jff.2008.09.013.
(http://www.sciencedirect.com/science/article/B9848-4TN5MRW-F/2/675fc05ae9df6d66b30959287a7048a5)
Abstract:
Soybean seeds with three different levels (low, intermediate and high) of isoflavones were processed to soy flour and soy protein isolates (SPIs) and developed into functional soy breads. The effect of factors involved in all steps of the process was investigated by tracking the composition and concentration of native forms of isoflavones. The total isoflavone contents were 8033.3, 10570.1 and 15169.0 nmol/g DM (dry matter) in the three soybeans; 13201.5, 20034.4 and 26014.3 nmol/g DM in defatted soy flours; 9113.2, 13274.6 and 17918.3 nmol/g DM in the SPI; 2782.7, 4081.4 and 5590.3 nmol/g DM in soy breads, respectively. The bread making processes did not affect the total isoflavone content, but changed glucosides/acetylglucosides to aglycones. Malonylglucosides were stable prior to baking but degraded to acetylglucosides and further to glucosides during baking. Our results provide critical information for the production of functional soy breads that contain varying amounts of soy isoflavones.
Keywords: Soybean; Soy bread; Isoflavones; Food processing; Functional food; Dough; Proofing

Yadahally N. Sreerama, Vadakkot B. Sashikala, Vishwas M. Pratape, Expansion properties and ultrastructure of legumes: Effect of chemical and enzyme pre-treatments, LWT - Food Science and Technology, Volume 42, Issue 1, 2009, Pages 44-49, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.07.005.
(http://www.sciencedirect.com/science/article/B6WMV-4T263BT-2/2/24b818b7b0d6a92bf75674e7050b83d6)

Abstract:
Expanded cereals and legumes are commonly used as ready-to-eat breakfast foods or as ingredients in food formulations. The use of horse gram and pigeon pea in food formulations and in legume composite flours is limited due to the presence of high levels of antinutritional factors, poor functional and expansion properties. Sodium bicarbonate and protease pre-treatments altered the cell wall structure of these legumes leading to the development of expanded grains. Expansion processing of pre-treated legumes resulted in statistically significant ($P < 0.05$) increases in grain size and expansion volume compared to control grains. Highest yield of expanded grains were obtained with sodium bicarbonate pre-treatment (80 grains/100grains in pigeon pea and 96 grains/100 grains in horse gram), whereas, protease treatment yielded 68 and 94 expanded grains per 100 grains of pigeon pea and horse gram, respectively. Pre-treated expanded grains had lower bulk densities in the range of 480-510 g/L compared to untreated controls (about 760 g/L). Increased porosity and decreased cell wall thickness in expanded grains resulted in the collapse of cell walls and the appearance of large void spaces within the intercellular matrix. These results suggest the potential utility of under-utilized expanded pigeon pea and horse gram grains or their flours as ingredients in food processing or in legume composite flours.
Keywords: Pigeon pea; Horse gram; Expanded legumes; Ultrastructure; Composite flour

Shobhana Garg, Pankaj Sharma, S.G. Jayaprakashan, R. Subramanian, Spray evaporation of liquid foods, LWT - Food Science and Technology, Volume 42, Issue 1, 2009, Pages 119-124, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.04.001.
(http://www.sciencedirect.com/science/article/B6WMV-4SBHXCK-3/2/7d0c29ba3824a3686e5d12aca3ef3c1f)
Abstract:
`Spray evaporation' based on the principle of adiabatic humidification was examined as an evaporation technique for the concentration of two types of representative liquid foods, namely, fruit juice and milk. The concentration of apple juice could be increased from 10.0 to 13.0 [degree sign]Brix by this technique without application of heat utilizing the humidity potential to an extent of 89%. Employing heated process air during processing increased the amount of water evaporation owing to increased saturation humidity level, enabling higher concentrations to be achieved in apple juice (48 [degree sign]Brix), reconstituted milk (29 [degree sign]Brix) and single toned milk (22 [degree sign]Brix). Feed flow rate had an inverse effect on the final concentration under otherwise similar conditions. Evaporative cooling associated with spray evaporation actually delivered the concentrate at a relatively lower temperature. By manipulating the operating conditions, humidity potential could be utilized to the extent of 55% with heated process air. The spray evaporation technique seemed to have a good potential for the concentration of liquid foods.
Keywords: Adiabatic humidification; Apple juice; Evaporative cooling; Milk; Spray evaporation

B. Zhao, O.A. Basir, G.S. Mittal, Detection of occluded small objects in glass bottles filled with beverages via ultrasound center frequency tracing, LWT - Food Science and Technology, Volume 42, Issue 1, 2009, Pages 162-167, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.05.016.
(http://www.sciencedirect.com/science/article/B6WMV-4SM62P7-2/2/d17402585ab564102b4b57ac381f2abe)
Abstract:
Detection of small foreign objects that lie on the bottom or attached to the wall of bottles or containers filled with beverages represents a significant challenge. This is because the echo signals from the object are fused with that reflected from the bottle or container inner surface. The latter has much higher signal energy that masks that of the former. This study formulates the problem as an image construction and processing problem and proposes an algorithm to facilitate object detection using the constructed images. The algorithm is based on the longitudinal (vertical)

tracing of a center frequency component obtained using short time Fourier transform (STFT) in conjunction with a transversal (horizontal) differentiation of the image pixels. This method is demonstrated to have improved ability to detect small glass fragments contained inside a glass bottle.
Keywords: Ultrasound; Foreign body detection; Signal processing; Short time Fourier transform; Food packaging; Food safety

Vazquez-Ovando Alfredo, Rosado-Rubio Gabriel, Chel-Guerrero Luis, Betancur-Ancona David, Physicochemical properties of a fibrous fraction from chia (Salvia hispanica L.), LWT - Food Science and Technology, Volume 42, Issue 1, 2009, Pages 168-173, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.05.012.
(http://www.sciencedirect.com/science/article/B6WMV-4SK633F-4/2/780862f25d97b4339470ccef3b9d895d)
Abstract:
An evaluation was done of some physicochemical properties of a fiber-rich fraction (FRF) obtained by dry processing of defatted chia (Salvia hispanica) flour. The fiber-rich fraction (FRF) had 29.56 g/100 g crude fiber content and 56.46 g/100 g total dietary fiber (TDF) content, of which 53.45 g/100 g was insoluble dietary fiber (IDF) and 3.01 g/100 g was soluble dietary fiber (SDF). The FRF water-holding capacity was 15.41 g/g, its water absorption capacity 11.73 g/g, and its organic molecule absorption capacity 1.09 g/g. The FRF also had low oil-holding (2.02 g/g) and water adsorption (0.3 g/g) capacities. Emulsifying activity in this fraction was 53.26% and emulsion stability was 94.84%. Its evaluated antioxidant activity was 488.8 [mu]mol/L Trolox equivalents/g FRF, which is higher than for many cereals and similar to drinks such as wine, tea, coffee and orange juice. The chia FRF values for the evaluated properties, particularly for water-holding, oil-holding and organic molecule absorption capacity, suggest it could be a useful ingredient in dietetic products such as baked and fried foods, among others.
Keywords: Chia; Salvia hispanica; Dietary fiber; Physicochemical properties; Functional properties

Hsin-Ping Ou, Chiun-C.R. Wang, Lih-Shiuh Lai, Thermal degradation kinetics analysis of monacolin K in Monascus-fermented products, LWT - Food Science and Technology, Volume 42, Issue 1, 2009, Pages 292-296, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.05.021.
(http://www.sciencedirect.com/science/article/B6WMV-4SNGMCW-3/2/ebb2fc5d386127a8616d2a9ffc77b437)
Abstract:
The objectives of this study were to investigate the thermal degradation kinetics of monacolin K in Monascus-fermented product (MP) solution. The results indicated that monacolin K content in MP solution remained fairly constant in the range of pH 3-9. However, heat treatment significantly decreased the content of monacolin K in MP solution, for example, from 75.8% under 100 [degree sign]C, 60 min to 54.3% under 100 [degree sign]C, 90 min at pH 9. Moreover, if the heating temperature was increased to 121 [degree sign]C for 90 min at pH 9, the content of monacolin K rapidly decreased to 14.1%. The thermal degradation of monacolin K followed a first-order reaction kinetic. The temperature dependence of rate constants followed Arrhenius relationship, with an activation energy value of 126.64 kJ/mol (90-121 [degree sign]C, r2 = 0.99). Our results suggest that monacolin K is easily degraded when the MP solution is heated to a high temperature (such as 121 [degree sign]C). However, more than 50% of monacolin K could be remained when the MP solution is heated under the pasteurization temperature used for food processing.
Keywords: Monacolin K; Thermal degradation kinetics; Heating time and temperature; pH

Miroslav Tratnik, Ramona Franic, Kristina Svrznjak, Ferdo Basic, Land rents as a criterion for regionalization--The case of wheat growing in Croatia, Land Use Policy, Volume 26, Issue 1,

Formalisation of Land Rights in the South, January 2009, Pages 104-111, ISSN 0264-8377, DOI: 10.1016/j.landusepol.2008.01.012.
(http://www.sciencedirect.com/science/article/B6VB0-4SJR2JX-1/2/138b274d30e669644af6cd9830f18ef5)
Abstract:
The paper explores and tests one of the contemporary principles of economic regionalization of agriculture by using differential land rents in wheat production as a model. The analysis is based upon the assumption that differential rents could serve as a valid principle for regional planning, particularly differential rent I. On the basis of the food self-sufficiency principle declared by the Rome Declaration on World Food Security, the model assesses the economic justification of the Croatian wheat incentives system in relation to wheat production potentials in the counties, starting from those with high potential (the most favourable agroecological conditions for wheat production) towards the counties with low potential, to the level of self-sufficiency as a long-term Croatian strategic vision.
The model shows that Croatia can meet its requirements for industrial wheat processing at the level of cumulative farmland areas of three counties, while total consumption can be covered by production of eight counties. This model compromises the fundamental principle of regional economics of wheat production, because up to 2003 incentives were given for 78,000 ha more than what was economically justified for wheat production intended for industrial processing, i.e. for 19,000 ha for total wheat demand. But, wheat production is practised all over Croatia--in all agricultural regions because of tradition on the one side and crop rotation requirements on the other side. This conclusion points to an uneconomic allocation of budget funds for wheat incentives to the counties, whose output results do not justify the incentives. The current subsidy model stimulates production by applying the criterion of a minimum three-hectare area required for wheat incentives. Consequently, a part of wheat production is excluded from the incentive system in the counties with high potential farmland, i.e. in the counties collecting a differential land rent for wheat production, which is uneconomical in terms of macroeconomics.
Even though the model featured in this paper exemplifies wheat production in this particular situation, it can be easily used to evaluate the efficiency of incentives for all the crops included in the incentive system, while applying the standards of economics and agricultural regionalization. It can also be used to determine subsequent, more economical distribution of production incentives by channelling uneconomically allocated budget funds into implementation of other agricultural policies and measures.
Keywords: Land rents; Wheat production; Agricultural regionalization; Croatia

Ana M. Diez, Eva M. Santos, Isabel Jaime, Jordi Rovira, Effectiveness of combined preservation methods to extend the shelf life of Morcilla de Burgos, Meat Science, Volume 81, Issue 1, January 2009, Pages 171-177, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2008.07.015.
(http://www.sciencedirect.com/science/article/B6T9G-4T2S8WM-2/2/3bcaf7a79f29dc6f407024c05beb2cdd)
Abstract:
Morcilla de Burgos is the most famous blood sausage in Spain. However, while producers are interested in extending its shelf life, the consumer is increasingly demanding more natural food. This situation has led to the current search for new and mild preservation technologies. Two batches of four different products: control without any treatment, control with organic acid salts (CnOAS; a 3% mixture of potassium/sodium l-lactate), control with high hydrostatic pressure processing (CnHPP; 600 MPa-10 min), and a combination of both treatments (OAS + HPP), were carried out to evaluate any synergistic effect that occurs when combining OAS and HPP, and the influence of different preservative treatments on the spoilage bacterial population and their evolution. HPP (with or without addition of OAS) can be considered the most suitable method for preserving morcilla de Burgos as it does not produce negative changes in sensory attributes. No

clear selective effect of different treatments on the composition of the spoilage bacteria was seen and similar spoilage patterns were observed independently of the preservation treatment used.
Keywords: Morcilla; HPP; Organic acid salts; Spoilage; Shelf life

M.C. Gomez-Guillen, M. Perez-Mateos, J. Gomez-Estaca, E. Lopez-Caballero, B. Gimenez, P. Montero, Fish gelatin: a renewable material for developing active biodegradable films, Trends in Food Science & Technology, Volume 20, Issue 1, January 2009, Pages 3-16, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.10.002.
(http://www.sciencedirect.com/science/article/B6VHY-4TTMJPP-1/2/bb6f069d8a6a880512f351b421000c85)
Abstract:
Most films used to preserve foodstuffs are made from synthetic plastic materials. However, for environmental reasons, attention has recently turned to biodegradable films. Gelatin has been extensively studied for its film-forming capacity and applicability as an outer covering to protect food against drying, light, and oxygen. Moreover, it is one of the first materials proposed as a carrier of bioactive components. Gelatins from alternatives to mammalian species are gaining prominence, especially gelatins from marine fish species. Because of their good film-forming abilities, fish gelatins may be a good alternative to synthetic plastics for making films to preserve foodstuffs. The mechanical and barrier properties of these films depend largely on the physical and chemical characteristics of the gelatin, especially the amino acid composition, which is highly species specific, and the molecular weight distribution, which depends mainly on processing conditions. Different film formulations can be developed to extend the films' physical and chemical properties and to add new functional attributes. This paper reviews the most recent scientific literature dealing with films based on gelatins from different fish species and considers various strategies intended to improve the physical properties of such films by combining fish gelatins with such other biopolymers as soy protein isolate, oils and fatty acids, and certain polysaccharides. The use of plasticizers and cross-linking agents is also discussed. Specific attributes, such as antimicrobial and antioxidant activities, may be also conferred by blending the gelatin with chitosan, lysozyme, essential oils, plant extracts, or vitamin C to produce an active packaging biomaterial.

M. Mauermann, U. Eschenhagen, Th. Bley, J.-P. Majschak, Surface modifications - Application potential for the reduction of cleaning costs in the food processing industry, Trends in Food Science & Technology, Volume 20, Supplement 1, EHEDG Yearbook 2009, January 2009, Pages S9-S15, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.020.
(http://www.sciencedirect.com/science/article/B6VHY-4VC7DW8-2/2/0bb9dc139014130b2dc1bf853a1b9378)
Abstract:
Machine contamination poses serious problems to the food processing industry particularly from an economic and hygienic perspective. Various studies therefore investigated the impact of energy-related and topography-related surface properties on the contamination tendency and the cleanability of material probes. These tests were carried out with stainless steel as reference as well as 46 surface modifications taken from the area of polymer coatings, nanocomposite coatings and physical/chemical vapour depositions (PVD/CVD) on the basis of whey protein and starch contamination. The findings showed that starch deposits on modified surface specimens were reduced by up to 76% (Fluorinated ethylene propylene, FEP) in contrast to stainless steel. Whey protein deposits were reduced by up to 34% (nanocomposite). The remaining starch contamination after one spray cleaning was reduced by up to 50% (FEP) and the whey protein contamination was reduced by up to 88% (FEP). Comparing the roughness and surface energy with the contamination and cleaning behaviour yields no clear correlation. But depending on the kind of contamination there is the tendency that low energetic surfaces show a better cleanability

or less deposits. Furthermore, the surface modifications tested showed different abrasion resistance and different levels of resistance to repeated stress with detergents.

Giampaolo Betta, Davide Barbanti, Roberto Massini, Flow diversion in aseptic processing and packaging systems: how guidelines allow avoiding bad design, Trends in Food Science & Technology, Volume 20, Supplement 1, EHEDG Yearbook 2009, January 2009, Pages S28-S33, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.041.
(http://www.sciencedirect.com/science/article/B6VHY-4VC7DW8-5/2/a9013a11086bdc99f969afee9d7a335b)
Abstract:
Flow diversion is a matter of concern for Food Hygiene in Aseptic Processing and Packaging Systems. The relevant standards and guidelines have been examined: since the Aseptic Processing is a widely used and well-established technology, there is quite a lot of available material. The flow diversion topic is also addressed, particularly by EHEDG Guidelines. The correct choice of the temperature probe, also plays an important role in the successful design of a flow diversion system. A procedure, which also includes simple simulation tools, has been developed in order to properly design the flow diversion device. A real case study is also reported. This research reaffirms that it is necessary to have more regard to standards and guidelines and also shows how guidelines allow avoiding bad design.

Roger Scheffler, Maximizing sanitation efforts in food processing: the importance of conveyor hygiene, Trends in Food Science & Technology, Volume 20, Supplement 1, EHEDG Yearbook 2009, January 2009, Pages S40-S43, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.012.
(http://www.sciencedirect.com/science/article/B6VHY-4VBDK8C-4/2/0bf84cae16680a53fbd358e1e9acc50f)

Ralf Weinekotter, Compact and efficient continuous mixing processes for production of food and pharmaceutical powders, Trends in Food Science & Technology, Volume 20, Supplement 1, EHEDG Yearbook 2009, January 2009, Pages S48-S50, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.037.
(http://www.sciencedirect.com/science/article/B6VHY-4VC7DW8-7/2/b1761e3225ad695a36acbcae899b455b)
Abstract:
Many food and pharmaceutical powders have traditionally been manufactured in batch processes. Especially for larger capacities (>1000 kg/h), the food industry is using continuous processing (e.g. salt mixtures, cereals, chocolate) if the number of mixture components is limited. However, even for lower capacity food and pharmaceutical production, more economical and more efficient production methods will be required in the future, particularly for blockbuster products whose patent protection has expired. The US Food and Drug Administration (FDA) has a large-scale development program that is currently testing the continuous production method. The PAT (Process Analytical Technology) Initiative requires implementation of in-process monitoring systems and controls in the mixing process. Gericke has developed continuous mixing and metering systems for this low-throughput range with the required accuracy, that also meet the highest hygienic requirements. The testing and model calculations demonstrate that the efficiency (statistically expressed as the relative standard deviation) is determined not only by the process parameters such as the average residence time and the metering constancy, but also by the particle size distribution and the concentration range of the active substance. This active substance may be considered to be vitamins in food or active ingredients for pharmaceutical products.

Hilko van der Voet, Gerie W.A.M. van der Heijden, Peter M.J. Bos, Sieto Bosgra, Polly E. Boon, Stefan D. Muri, Beat J. Bruschweiler, A model for probabilistic health impact assessment of exposure to food chemicals, Food and Chemical Toxicology, In Press, Corrected Proof, Available online 27 December 2008, ISSN 0278-6915, DOI: 10.1016/j.fct.2008.12.027.
(http://www.sciencedirect.com/science/article/B6T6P-4V7MSTJ-2/2/45a63472ea1f05962475b96458193801)
Abstract:
A statistical model is presented extending the integrated probabilistic risk assessment (IPRA) model of van der Voet and Slob [van der Voet, H., Slob, W., 2007. Integration of probabilistic exposure assessment and probabilistic hazard characterisation. Risk Analysis, 27, 351-371]. The aim is to characterise the health impact due to one or more chemicals present in food causing one or more health effects. For chemicals with hardly any measurable safety problems we propose health impact characterisation by margins of exposure. In this probabilistic model not one margin of exposure is calculated, but rather a distribution of individual margins of exposure (IMoE) which allows quantifying the health impact for small parts of the population. A simple bar chart is proposed to represent the IMoE distribution and a lower bound (IMoEL) quantifies uncertainties in this distribution. It is described how IMoE distributions can be combined for dose-additive compounds and for different health effects. Health impact assessment critically depends on a subjective valuation of the health impact of a given health effect, and possibilities to implement this health impact valuation step are discussed. Examples show the possibilities of health impact characterisation and of integrating IMoE distributions. The paper also includes new proposals for modelling variable and uncertain factors describing food processing effects and intraspecies variation in sensitivity.
Keywords: Integrated probabilistic risk assessment (IPRA); Individual margin of exposure (IMoE); Cumulative exposure; Combining health effects

L. Ruiz-Garcia, G. Steinberger, M. Rothmund, A model and prototype implementation for tracking and tracing agricultural batch products along the food chain, Food Control, In Press, Corrected Proof, Available online 24 December 2008, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.12.003.
(http://www.sciencedirect.com/science/article/B6T6S-4V74XKJ-3/2/63ff8c89d6490743fc5dba70621c6821)
Abstract:
There is an increasing demand of traceability in the food chain, statutory requirements are growing stricter and there is increasing pressure to develop standardized traceability systems. Each event in the chain, like production of transportation, packing, distribution or processing results in a different product which can have its own information associated within the tracing system. From the raw material to the sale of goods, more and more information needs to be gathered and made available. Supplementary information may also be collected at any step, in order to provide data for analysis and optimization of production practices.
Using web-based systems for data processing, storage and transfer makes possible a flexible way of information access, networking and usability. In this paper an architectural proposal is presented and the proposed solution is tested by the implementation of a prototype. The software architecture presented makes use of a series of standards than offer new possibilities in traceability control and management. For testing the prototype, information from precision farming together with the information recorded during the transport and delivery was used. The system enables full traceability and it complies with all existing traceability standards.
Keywords: Traceability; Web service; Monitoring logistics; IT-farming; Automated documentation

Jianping Wu, Rotimi E. Aluko, Alister D. Muir, Purification of angiotensin I-converting enzyme-inhibitory peptides from the enzymatic hydrolysate of defatted canola meal, Food Chemistry,

Volume 111, Issue 4, 15 December 2008, Pages 942-950, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.05.009.
(http://www.sciencedirect.com/science/article/B6T6R-4SGD4XD-2/2/beffb81f43ce8c456c41d36cdc872bbb)
Abstract:
Defatted canola meals from seeds of different processing origins were hydrolyzed by Alcalase to give hydrolysates that inhibited angiotensin converting enzyme (ACE) activity. Heat treated meals yielded protein hydrolysates with 50% ACE-inhibitory concentrations of 27.1 and 28.6 [mu]g protein/ml compared with 35.7 and 44.3 [mu]g protein/ml for the none-heat treated meals. Separation of the hydrolysate on a Sephadex G-15 gel permeation column (GPC) yielded a fraction with an IC50 value of 2.3 [mu]g protein/ml. Amino acid analysis showed that the GPC fraction contained 45% content of aromatic amino acids in comparison to 8.5% of the hydrolysate. Two peptides, Val-Ser-Val (IC50 = 0.15 [mu]M) and Phe-Leu (IC50 = 1.33 [mu]M) were purified, and located in the primary structure of canola napin and cruciferin native proteins. The results suggest that canola protein hydrolysate is a potential ingredient for the formulation of hypotensive functional foods.
Keywords: Defatted canola meal; Angiotensin converting enzyme; Peptides; IC50; Alcalase; Protein hydrolysates; Purification

Imca Sampers, Ihab Habib, Dirk Berkvens, Ann Dumoulin, Lieven De Zutter, Mieke Uyttendaele, Processing practices contributing to Campylobacter contamination in Belgian chicken meat preparations, International Journal of Food Microbiology, Volume 128, Issue 2, 10 December 2008, Pages 297-303, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.08.024.
(http://www.sciencedirect.com/science/article/B6T7K-4TG9HMG-1/2/1a10f5f4ac9e5e420b2e15756f480764)
Abstract:
The aim of this study was to obtain insight into processing practices in the poultry sector contributing to the variability in Campylobacter contamination in Belgian chicken meat preparations. This was achieved by company profiling of eleven food business operators, in order to evaluate variation of processing management, in addition to statistical modelling of microbiological testing results for Campylobacter spp. contamination in 656 end product samples.
Almost half (48%) of chicken meat preparation samples were positive for Campylobacter spp. Results revealed a statistically significant variation in Campylobacter contamination between 11 chicken meat producers across Belgium at both quantitative and qualitative detection levels. All producers provided Campylobacter-positive samples, but prevalence ranged from 9% up to 85% at single producer level. The presence or addition of skin during production of chicken meat preparations resulted in almost 2.2-fold increase in the probability of a sample being positive for Campylobacter, while chicken meat preparations made from frozen meat, or partly containing pre-frozen meat, had a significant (Odds Ratio = 0.41; CI 95% 0.18:0.98) lower probability of being positive for Campylobacter. However, the quantitative results indicated that the positive freezing effect on Campylobacter count was compromised by the presence and/or adding of skin.
Keywords: Food; Processing practices; Campylobacter; Chicken meat preparations; Freezing; Skin

Manuel Simoes, Lucia C. Simoes, Maria J. Vieira, Physiology and behavior of Pseudomonas fluorescens single and dual strain biofilms under diverse hydrodynamics stresses, International Journal of Food Microbiology, Volume 128, Issue 2, 10 December 2008, Pages 309-316, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.09.003.
(http://www.sciencedirect.com/science/article/B6T7K-4TFW95G-2/2/ecff85645d64776ba1ac23b0ae87b20c)
Abstract:

Three selected Pseudomonas fluorescens strains (the type strain and two strains originally isolated from a dairy processing plant -- D3-348 and D3-350) were used to form turbulent and laminar flow-generated biofilms under laboratorial conditions using flow cell reactors with stainless steel substrata. The D3-348 and D3-350 strains were also used to form dual biofilms. Biofilm phenotypic characteristics, such as respiratory activity, total and culturable cells, biomass, total and matrix proteins and polysaccharides were compared. Biofilm mechanical stability, as a major feature involved in biofilm persistence, was also assessed using a rotating device system. The results indicate that hydrodynamic conditions have a remarkable impact on biofilm phenotype. Turbulent biofilms were more active, had more mass per adhesion surface area, a higher number of total and culturable cells, a higher amount of total proteins per gram of biofilm, similar matrix proteins and identical (D3-348 and D3-350 single and dual biofilms) or smaller (type strain) total and matrix polysaccharides content than their laminar counterparts. Biofilms formed by the type strain revealed a considerable higher amount of total and culturable cells and a higher amount of total proteins (turbulent biofilms) and total and matrix polysaccharides per gram of biofilm than single and dual biofilms formed by the other strains. Mechanical stability assays disclosed that biofilms formed by both type and D3-348 strains had the highest resistance to removal when exposed to mechanical stress. Dual strain biofilms population analysis revealed an apparent co-existence, evidencing neutral interactions. The overall results provided useful information regarding a broad spectrum of P. fluorescens biofilm phenotypic parameters, which can contribute to control and model biofilm processes in food industry.
Keywords: Bacterial interactions; Biofilm phenotype; Biofouling; Dual biofilms; Hydrodynamic conditions

P. Nisha, Rekha S. Singhal, Aniruddha B. Pandit, A study on degradation kinetics of niacin in potato (Solanum tuberosum L.), Journal of Food Composition and Analysis, In Press, Corrected Proof, Available online 3 December 2008, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.11.005.
(http://www.sciencedirect.com/science/article/B6WJH-4V2NKBX-2/2/d0a867954ab0a1240a764fb1d3d8d031)
Abstract:
The kinetics of niacin degradation in potato (Solanum tuberosum L.) as well as in pure niacin solutions at initial concentrations present in potato has been studied over a temperature range of 50-120 [degree sign]C (isothermal process). Niacin degradation followed first-order kinetics, where the rate constant increased with an increase in the temperature. The temperature dependence of degradation was adequately modeled by the Arrhenius equation. The degradation kinetics of niacin in normal open pan cooking, pressure-cooking and a newly developed and patented fuel-efficient 'EcoCooker' has also been studied (non-isothermal process). A mathematical model has been developed using the isothermal kinetic parameters obtained to predict the losses of niacin from the time-temperature data of the non-isothermal heating/cooking process. The results obtained indicate a niacin degradation of a similar magnitude in all three modes of cooking used in the study.
Keywords: Niacin degradation; Kinetics; Potato; Cookers; Food processing; Thermal processing of food; Vitamin retention; Vitamin loss; Food quality; Food composition

Wenqi Ma, Jianhui Li, Lin Ma, Fanghao Wang, Istvan Sisak, Gregory Cushman, Fusuo Zhang, Nitrogen flow and use efficiency in production and utilization of wheat, rice, and maize in China, Agricultural Systems, Volume 99, Issue 1, December 2008, Pages 53-63, ISSN 0308-521X, DOI: 10.1016/j.agsy.2008.10.001.
(http://www.sciencedirect.com/science/article/B6T3W-4TXDXP7-1/2/f81e9617474627e136313f05e61e5f73)
Abstract:

China has long been the world's most populous nation and faced the double challenge of ensuring its food security without causing catastrophic damage to the environment. Since the early 1960s, Chinese agricultural development has been premised on large domestic increases in nitrogen (N) fertilizer production and consumption. However, current utilization of fertilizer is far beyond optimum, with the fate of excess N largely unknown. Here, we report on N flows, losses, and use efficiency in the production and utilization of three major grain crops using data from 2004. We also use a scenario analysis to explore strategies for improving N use efficiency. Our calculations show that N use efficiency in food production and utilization is much lower than previously published estimates. Mean N surpluses of crop fields were 144 kg/ha for wheat, 184 kg/ha for rice, and 120 kg/ha for maize. We estimate that between 50% and 85% of N harvested as grain is lost for utilization by humans and animals. Fertilizer N use efficiency (FNUE) values in crop-animal system for wheat, rice, and maize were 13.4%, 11.3%, and 3.7%, respectively. This means 7.5, 8.9 and 27.1 kg of N fertilizer were required to produce 1 kg of N in food via fertilization for these three grains. Major room exists for improving the efficiency of N flow in Chinese crop systems. Our scenario analyses shows that increases in N use efficiency of fertilizer applied to cropland (RE), decreasing ratios of grain N headed to plant food processing (GUP), and increasing efficiency in animal production (ANU) would result in a marked decrease in N loss from these three crops amounting to one million ton of N, which accounted for 6% of total chemical fertilizer input. Improved N management in Chinese food production has major ramifications for global estimations of N use efficiency and environmental pollution by reactive N, particularly nitrous oxide emissions, a major anthropogenic contributor to global climate change.
Keywords: China; Fertilizer; Food supply; Nitrogen; Nutrient management

Jazeem Wahab, Medicinal and Aromatic Crops. Harvesting, Drying and Processing. Serdar Oztekin, Milan Martinov (Editors). Haworth Food and Agricultural Products Press, Binghamton, New York, USA, xx + 320 pp, 2007. US$49.95 (softback) ISBN: 978-1-56022-975-9; US$89.95 (hardback) ISBN: 978-1-56022-974-2., Agricultural Systems, Volume 99, Issue 1, December 2008, Page 65, ISSN 0308-521X, DOI: 10.1016/j.agsy.2008.04.003.
(http://www.sciencedirect.com/science/article/B6T3W-4TDYP4Y-1/2/cc7aaf9a2cc6e040e8f6eae8e091bb7a)

B.K. Tiwari, K. Muthukumarappan, C.P. O'Donnell, M. Chenchaiah, P.J. Cullen, Effect of ozonation on the rheological and colour characteristics of hydrocolloid dispersions, Food Research International, Volume 41, Issue 10, December 2008, Pages 1035-1043, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.07.011.
(http://www.sciencedirect.com/science/article/B6T6V-4T2631X-4/2/ecd3daa1c7fd33f95ed24d7884aea18a)
Abstract:
The effect of ozonation on the rheological and colour characteristics of guar, carboxyl methyl cellulose (CMC), and pectin dispersions was investigated. Guar 1%, CMC 1% and pectin 2% (w/v) dispersions were ozonated at varying ozone concentrations of 2.4%, 4.0%, 5.6% and 7.8% (w/w) for 3, 5, 7 and 10 min processing times at 20 +/- 1.0 [degree sign]C. Flow and dynamic rheological properties together with Hunter colour parameters (L*, a*, b*) were measured for control and treated samples. Significant differences were observed in the rheological characteristics and colour of all ozonated hydrocolloid dispersion studied. No recovery was observed in the structure breakdown after a 24 h storage period. This study indicates that ozonation has a significant effect on both the rheology and colour of hydrocolloid dispersions and that due attention should be given before incorporating these hydrocolloids in food formulations which are subsequently ozonated in food processing and preservation processes.
Keywords: Hydrocolloid; Ozone; Rheology; Colour

James W.E. Rush, Pamela S. Jantzi, Kourtney Dupak, Stefan H.J. Idziak, Alejandro G. Marangoni, Effect of food preparation on the structure and metabolic responses to a monostearin-oil-water gel-based spread, Food Research International, Volume 41, Issue 10, December 2008, Pages 1065-1071, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.07.017.
(http://www.sciencedirect.com/science/article/B6T6V-4T542BN-1/2/3e5f2e6dfff890f0d75e1693ba9f4f4a)
Abstract:
Widespread recognition of the negative health effects of trans and saturated fats has prompted research to develop alternative structures that can structure liquid oils into semi-solid plastic pastes for food applications. We have recently developed and described the physical chemical properties of a unique a monostearin-oil-water gel (MAG) that achieves this goal. Furthermore, ingestion of this MAG in the form of a margarine-like spread resulted in beneficial suppression of blood lipid and insulin responses in humans compared to compositionally-equivalent controls lacking the MAG structure. However, the integrity of this novel structure and its salubrious metabolic effects have not been previously evaluated under food processing conditions. The purpose of the current study was to evaluate the integrity of the MAG when applied to toasted bread and when mixed with a warm pasta meal, and to evaluate the metabolic effects over 6 h following ingestion of both types of meals with MAG compared to compositionally-equivalent unstructured oil preparations. MAG structure was maintained in the toast study, but the pasta meal destroyed the MAG structure. Triglyceride, free fatty acid, and insulin responses were suppressed in the MAG trial compared to the unstructured oil trial of the toast study, whereas there was no difference in the responses of these variables between the two trials in the pasta study. The results demonstrate for the first time that the metabolic effects of MAG depend on maintenance of the MAG structural integrity throughout the food processing procedures leading up to ingestion. Thus, this study demonstrates the utility of MAG as a trans- and saturated fat-free vehicle to structure and deliver liquid oil as a semi-solid plastic paste, and establishes processing limits to the integrity of the additional beneficial metabolic effects of this novel structure.
Keywords: Monoglyceride; Gel; Liquid crystal; Coagel; Serum lipids; Insulin

S.K. Wimalaratne, M.M. Farid, Pressure assisted thermal sterilization, Food and Bioproducts Processing, Volume 86, Issue 4, December 2008, Pages 312-316, ISSN 0960-3085, DOI: 10.1016/j.fbp.2007.08.001.
(http://www.sciencedirect.com/science/article/B8JGD-4RWBWW1-2/2/b254f5c8f03ee7a8ccf03011bdc24f0f)
Abstract:
High pressure processing (HPP) can inactivate various types of microorganisms in their vegetative form. However, spores can be resistant to pressures as high as 1000 MPa, which in the absence of heat limits the application of HPP to pasteurization only. A new technology has been recently developed to generate mild pressure by heating the treated liquid food in enclosure. This technology was examined for its ability to inactivate spore forming bacteria (Bacillus cereus and Geobacillus stearothermophilus) to produce a sterile product which retained its original organoleptic characteristics. Results shows that this pressure assisted thermal sterilization process could decrease the decimal reduction time (D-value) and hence, reduce the sterilization temperature significantly. The mild pressure generated assisted spores to germinate allowing the heat to inactivate the germinated spores. Vegetative microorganisms (Saccharomyces cerevisiae and Escherichia coli) were also tested using the technology. However, the effect of this mild pressure on the inactivation was found insignificant.
Keywords: High pressure processing; Thermal sterilization; Bacillus cereus; Geobacillus stearothermophilus; Saccharomyces cerevisiae; Escherichia coli

K.V. Gernaey, 'Erratum to Editor's name' [Food and Bioproducts Processing (2008) 86 (2), outside back cover and contents list], Food and Bioproducts Processing, Volume 86, Issue 4, December 2008, Page 322, ISSN 0960-3085, DOI: 10.1016/j.fbp.2008.07.002.
(http://www.sciencedirect.com/science/article/B8JGD-4TF69KV-1/2/3f19e2198591b06a7daae0e5ca1b2306)

Zhongwei Tang, Galina Mikhaylenko, Fang Liu, Jae-Hyung Mah, Ram Pandit, Frank Younce, Juming Tang, Microwave sterilization of sliced beef in gravy in 7-oz trays, Journal of Food Engineering, Volume 89, Issue 4, December 2008, Pages 375-383, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.04.025.
(http://www.sciencedirect.com/science/article/B6T8J-4SF2YYT-3/2/73cb185f19ca5d9988b77628f3c30bae)
Abstract:
This research was to investigate the feasibility for developing a short-time sterilization protocol for a highly inhomogeneous food prepackaged in polymeric trays using 915 MHz microwave (MW) energy. A 915-MHz, single-mode, 10-kW pilot-scale MW system developed at Washing State University was used for this study. The inhomogeneous food consisted of sliced beef and gravy packaged in 7-oz polymeric trays. Specially formulated whey protein gel, matching the beef product in their dielectric properties, was chosen as a model food to emulate the real food for determination of heating patterns and cold spots inside food trays. The heating patterns and cold spots were detected using a chemical-marker-assisted computer vision method. Processing schedules to achieve desired levels of F0 for 7-oz trays of beef in gravy were established based on temperature histories measured at the identified cold spot location. The developed processing schedules were validated by inoculated pack studies using Clostridium sporogenes PA 3679 spores. The results of this study indicate that the 915-MHz single-mode MW sterilization technology is effective for processing of the inhomogeneous food. The procedure established could be used for developing MW sterilization processes for other packaged inhomogeneous foods, such as chicken meat in gravy in trays and salmon in sauce in pouches. The processing data collected could be helpful for industrial scale-up of the MW system.
Keywords: Microwave sterilization; Processing schedule; Beef; Cold spot; Heating pattern; Inoculated pack studies

Bundit Jarimopas, Nitipong Jaisin, An experimental machine vision system for sorting sweet tamarind, Journal of Food Engineering, Volume 89, Issue 3, December 2008, Pages 291-297, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.05.007.
(http://www.sciencedirect.com/science/article/B6T8J-4SHF49G-2/2/68a53d934dc30a1d5da1ada4d8bcf736)
Abstract:
The purpose of this research was to develop an efficient machine vision experimental sorting system for sweet tamarind pods based on image processing techniques. Relevant sorting parameters included shape (straight, slightly curved, and curved), size (small, medium, and large), and defects. The variables defining the shape and size of the sweet tamarind pods were shape index and pod length. A pod was said to have defects if it contained cracks.
The experiment involved the use of pods from two sweet tamarind cultivars: 'Sitong' and 'Srichompoo'. The sorting system involved the use of a CCD camera which was adapted to work with a TV card, microcontrollers, sensors, and a microcomputer. Analysis was performed with image processing software. Analysis of variance was computed with regard to the variables of shape, size, and defects, and took into account variations in the control factors of belt speed, pod orientation, and spacing.
The results showed that the three control factors did not significantly affect shape, size, and defects at a significance level of 5%. The averaged shape indexes of the straight, slightly curved,

and curved pods were 51.1%, 61.6%, and 75.8%, respectively. Pod length was found to be influenced by size and cultivar, with Sitong and Srichompoo pods ranging from 10.0 to 14.0 cm and 8.5 to 12.4 cm, respectively. The vision sorting system could separate Sitong tamarind pods at an average sorting efficiency (Ew) of 89.8%, with a mean contamination ratio () of 10.2% at a capacity of 1517 pod/h. Respective figures for Srichompoo pods were Ew; 94.3%; , 5.7%; and capacity, 1491 pod/h. The contamination ratios met the export standards mandated by the Thai agricultural commodities and food codification.
Keywords: Sweet tamarind; Sorting; Image processing; Machine vision

Mohammed Aider, Damien de Halleux, Production of concentrated cherry and apricot juices by cryoconcentration technology, LWT - Food Science and Technology, Volume 41, Issue 10, December 2008, Pages 1768-1775, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.02.008.
(http://www.sciencedirect.com/science/article/B6WMV-4RXJYYN-1/2/76fe69979f71ec0c88a186a9c33d4756)
Abstract:
In this study, apricot and cherry juices were successfully cryoconcentrated. Two freezing temperatures -10 +/- 1 [degree sign]C, -20 +/- 1 [degree sign]C, and three cryoconcentration stages were studied. Freezing temperature did not show any affect on total dry matter content of the concentrated juices, as well as on their physico-chemical properties. At the same time, the cryoconcentration stage effect was highly significant on total dry matter content and juice qualities. Total dry matter of the apricot juice increased from 14.50 +/- 1.12 g/100 g up to 35.50 +/- 2.09 g/100 g in three cryoconcentration stages. Cherry juice total dry matter increased from 15.50 +/- 1.26 g/100 g up to 45.50 +/- 2.47 g/100 g. Concentrated juices had high aroma numbers and high content of ascorbic acid compared to the same juices obtained by the conventional method. The present study demonstrated that cryoconcentration as an environmentally friendly technology is a promising and highly effective food processing technique in the juice industry. Aroma number increased from 3.55 up to 8.38 and from 5.23 up to 15.75 for apricot and cherry juices, respectively. The juices obtained by cryoconcentration technology were compared to the same juices obtained by the conventional method of evaporation.
Keywords: Fruit juice; Cryoconcentration; Vitamins; Quality

Jorge Ruiz-Ruiz, Alma Martinez-Ayala, Silvina Drago, Rolando Gonzalez, David Betancur-Ancona, Luis Chel-Guerrero, Extrusion of a hard-to-cook bean (Phaseolus vulgaris L.) and quality protein maize (Zea mays L.) flour blend, LWT - Food Science and Technology, Volume 41, Issue 10, December 2008, Pages 1799-1807, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.01.005.
(http://www.sciencedirect.com/science/article/B6WMV-4RNR70J-2/2/c2cda542ecc2b9e424f1cf28596bfdf6)
Abstract:
Heated extrusion was tested as an alternative process for incorporating 'hard-to-cook' beans into food products. A 32 factorial design was used to evaluate extrusion conditions for a 40/60 (w/w) blend of 'hard-to-cook' beans and quality protein maize. Tested extrusion variables were temperature (155, 170 and 185 [degree sign]C) and moisture content (15.5, 17.5 and 19.5 g/100 g). Screw speed was fixed at 130 rpm. The extrudates obtained at 155 and 170 [degree sign]C with 15.5% moisture had the best physical characteristics and were chosen for comparative analysis of nutritional changes between the unprocessed 'hard-to-cook' bean/quality protein maize flour blend and the resulting extrudates. In vitro protein digestibility was higher in the extrudates (80%) than in the flour blend (76%). In vitro starch digestibility was higher at 155 [degree sign]C (89%) and 170 [degree sign]C (92%) than in the flour blend (12%). Processing conditions decreased dietary fibre content by 38% at 155 [degree sign]C and 44% at 170 [degree sign]C.
Keywords: Extrusion; QPM; Hard-to-cook beans; Nutritional changes

Anna Angela Barba, Antonella Calabretti, Matteo d'Amore, Anna Lisa Piccinelli, Luca Rastrelli, Phenolic constituents levels in cv. Agria potato under microwave processing, LWT - Food Science and Technology, Volume 41, Issue 10, December 2008, Pages 1919-1926, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.02.004.
(http://www.sciencedirect.com/science/article/B6WMV-4RTW416-1/2/983490ceae9495283ba0cfe8aca1bc3e)
Abstract:
Phenolic compounds have long been associated with flavour and colour characteristics of fruits and vegetables and actually attract a great interest due to their health protecting properties. In this work, the influence of different power input of microwave baking on the amount of protocatechuic acid (1), tryptophan (2), chlorogenic acid (3), neo-chlorogenic acid (4), and cryptochlorogenic acid (5) marker compounds left over in peeled and not-peeled potatoes (Solanum tuberosus L., Agria cultivar) was assessed. A high-performance liquid chromatographic (HPLC) method with diode-array detection (DAD) was used to identify and quantify compounds 1-5. Other tubers were used to perform analysis of raw potato (control) and traditional baking potatoes products (boiled potatoes). Dielectric behavior of the irradiated tubers was also investigated to emphasize if microwaves treatments are suitable for food processing in terms of nutritional factor preservation. The main results of this work consist on the relevance of the water contents in potato matrixes during the baking processes since these have a crucial role to keep lossy features, to avoid thermal damages and to preserve antioxidant. The best compromise in terms of short baking time and reduced water and phenolic losses is obtained using 500 W as power input.
Keywords: Solanum tuberosum; Microwave cooking; Food analysis; Phenolic compounds; HPLC-DAD

S. Guerra, C. Lagazio, L. Manzocco, M. Barnaba, R. Cappuccio, Risks and pitfalls of sensory data analysis for shelf life prediction: Data simulation applied to the case of coffee, LWT - Food Science and Technology, Volume 41, Issue 10, December 2008, Pages 2070-2078, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.01.011.
(http://www.sciencedirect.com/science/article/B6WMV-4RR900R-3/2/3775f8ec4cf4ddff73d1019b6f04bfac)
Abstract:
Shelf life determination by means of sensory analysis is thought to be of paramount importance even in case of a microbiologically stable food. Several approaches are found in literature, both in terms of data collection and data processing. Whatever method is used, the subjectivity in the choice of some parameters for data collection and analysis can deeply influence the final result. We put in evidence some typical pitfalls that the researcher should avoid when planning the test and analysing data. A comparison between the most utilized techniques in sensory data processing for shelf life prediction is reported, taking as a fil rouge the case of coffee. In particular, a non-linear regression, a logistic regression and a survival models were applied to simulated data frames of coffee. We evaluated the influence of the choice of acceptability limits, as well as the effect of data variability and we found out that they strongly influence predictions, as well as the panel and the batch of product do. We suggest that in case of microbiologically stable food, like coffee, shelf life is not univocal and it is a choice of the company or the researcher, rather than the result of the interaction between product and consumer.
Keywords: Shelf life; Sensory analysis; Logistic regression; Weibull model; Coffee

Katarzyna Waszkowiak, Krystyna Szymandera-Buszka, The application of wheat fibre and soy isolate impregnated with iodine salts to fortify processed meats, Meat Science, Volume 80, Issue 4, December 2008, Pages 1340-1344, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2008.06.011.
(http://www.sciencedirect.com/science/article/B6T9G-4STYV3T-3/2/b3447a3ca62b4e2c40704c852866b7da)

Abstract:
The aim was to use wheat dietary fibre and soy protein isolate as carriers of KI and KIO3 for fortification of processed meat with iodine. Products from minced pork were prepared with addition of iodised wheat fibre and soy isolate, and iodised table salt for comparison and the effects of thermal processing and storage on changes in iodine content were determined. It was shown that both alternative carriers limited the iodine changes in meat products compared with iodised table salt. However, wheat fibre was more effective in limiting iodine losses during thermal processing and soy protein during storage of the products. The greatest effect of the carriers was found in meat products fortified with the less stable KI.
Keywords: Iodine carriers; Wheat dietary fibre; Soy protein isolate; Iodine retention; Food fortification; Meat product

H.J. van der Fels-Klerx, S. Tromp, H. Rijgersberg, E.D. van Asselt, Application of a transmission model to estimate Performance Objectives for Salmonella in the broiler supply chain, International Journal of Food Microbiology, Volume 128, Issue 1, 5th International Conference on Predictive Modelling in Foods, 30 November 2008, Pages 22-27, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.06.034.
(http://www.sciencedirect.com/science/article/B6T7K-4SXH9W6-1/2/db96330c476172e14559946dd45a1792)
Abstract:
The aim of the present study was to demonstrate how Performance Objectives (POs) for Salmonella at various points in the broiler supply chain can be estimated, starting from pre-set levels of the PO in finished products. The estimations were performed using an analytical transmission model, based on prevalence data collected throughout the chain in The Netherlands. In the baseline (current) situation, the end PO was set at 2.5% of the finished products (at end of processing) being contaminated with Salmonella. Scenario analyses were performed by reducing this baseline end PO to 1.5% and 0.5%. The results showed the end PO could be reduced by spreading the POs over the various stages of the broiler supply chain. Sensitivity analyses were performed by changing the values of the model parameters. Results indicated that, in general, decreasing Salmonella contamination between points in the chain is more effective in reducing the baseline PO than increasing the reduction of the pathogen, implying contamination should be prevented rather than treated. Application of both approaches at the same time showed to be most effective in reducing the end PO, especially at the abattoir and during processing. The modelling approach of this study proved to be useful to estimate the implications for preceding stages of the chain by setting a PO at the end of the chain as well as to evaluate the effectiveness of potential interventions in reducing the end PO. The model estimations may support policy-makers in their decision-making process with regard to microbiological food safety.
Keywords: Food safety targets; Microbiological food safety; Supply chain modeling; Pathogen; Poultry production

A.L. Afchain, F. Carlin, C. Nguyen-the, I. Albert, Improving quantitative exposure assessment by considering genetic diversity of B. cereus in cooked, pasteurised and chilled foods, International Journal of Food Microbiology, Volume 128, Issue 1, 5th International Conference on Predictive Modelling in Foods, 30 November 2008, Pages 165-173, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.07.028.
(http://www.sciencedirect.com/science/article/B6T7K-4T4XR5J-1/2/de1b5ec3f81310911d431beb13f49831)
Abstract:
The natural contamination of foods with a bacterial pathogen frequently consists of a mixture of strains with their own characteristics of survival, growth potential and virulence. Quantitative

Microbial Risk Assessment (QMRA) must account for this genetic diversity to reflect the variability of the pathogen risk and to identify the genetic groups present at key stages of the food pathway. To describe the transmission dynamics of a heterogeneous population of B. cereus, we developed an exposure model that covers a food processing chain from 'farm to table'. The studied food was a cooked, pasteurised and chilled courgette puree used as an example of Refrigerated Processed Food of Extended Durability (REPFED). The B. cereus population consists of a continuum of genetic groups ranging from mesophilic and highly heat resistant, to psychrotrophic and moderately-heat resistant ones. At each step in a processing chain comprising cooking, blending, mixing with ingredients providing a secondary contamination, pasteurisation and chilling for several weeks, the prevalence of contaminated units (batches or packages) and the spore load within the units was determined for each genetic group, as well as their proportion to the total B. cereus population in the units. The model predicted that all packages contain mesophilic groups just after partitioning. The addition of mesophilic strains by the ingredients during the process of the courgette puree was an important contribution. At the end of the domestic storage, the model predicted a dominance of the mesophilic groups, while only some psychrotrophic groups were present.
Keywords: Bacillus cereus; Bacterial diversity; Quantitative microbial risk assessment; Modelling; Food production chain; Minimal processing; Monte Carlo simulation

Helga Margret Palsdottir, Agusta Gudmundsdottir, The novel trypsin Y from Atlantic cod (Gadus morhua) - isolation, purification and characterisation, Food Chemistry, Volume 111, Issue 2, 15 November 2008, Pages 408-414, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.04.005.
(http://www.sciencedirect.com/science/article/B6T6R-4S7BDM5-6/2/ef68612e1e2b8808c5163b8a4529d8c8)
Abstract:
This report describes the isolation and partial characterization of the novel group III trypsin Y from the pyloric caeca of Atlantic cod. Other Atlantic cod trypsins have been used as food processing aids with good results. Trypsin Y was purified by p-aminobenzamidine affinity chromatography and characterized by SDS-PAGE and western blot analysis, as well as by activity measurements towards synthetic substrates. Identification of trypsin Y was done with polyclonal antibodies raised towards the recombinant form of the enzyme and by MALDI-TOF mass spectrometry. Trypsin Y is the only group III trypsin isolated from its native source and characterized by biochemical methods. In accordance with the r-trypsin Y, the native enzyme shows dual substrate specificity, i.e. towards trypsin and chymotrypsin specific substrates. This, along with the high cold-adapted character of trypsin Y, may be valuable for its use as a processing aid for sensitive products such as seafood.
Keywords: Atlantic cod; Trypsin Y; Group III; Purification; Cold-adaptation

S. Romani, M. Bacchiocca, P. Rocculi, M. Dalla Rosa, Influence of frying conditions on acrylamide content and other quality characteristics of French fries, Journal of Food Composition and Analysis, In Press, Corrected Proof, Available online 5 November 2008, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.10.001.
(http://www.sciencedirect.com/science/article/B6WJH-4TVHSKG-5/2/2b50b484e407718525b8b3053703a397)
Abstract:
The objective of this work was to investigate the effect of processing frying conditions, simulating possible home and catering practices, in order to optimize the process to obtain a good final product limiting the acrylamide (AA) formation. Experiments were performed using commercially frozen pre-fried potato strips, a fixed initial frying temperature of 180 [degree sign]C, two different fryers for domestic (A) and catering (B) use, and two potato-to-oil ratios (1/4 and 1/8 w/v). Several batches were fried at different fixed times, and for each batch the temperature of oil and stick

surface were acquired by thermocouples. Analysis of AA and other quality characteristics (water and oil content, color, texture) of French fries were carried out. In all adopted frying conditions the increase of oil and potato surface temperature was faster in fryer A than in fryer B due to its peculiar manufacturing characteristics and employment mode. As a consequence, higher AA levels and a more cooked product were obtained using fryer A. With the immersion of a lower potato quantity (1/8 w/v), higher oil temperatures and AA levels and a more cooked product were obtained in shorter time in both fryers. Considering quality parameter results, the best quality characteristics were obtained in potatoes from fryer B between 10 and 13 min of frying with a product-to-oil ratio of 1/4 (around 250 +/- 20 [mu]g kg-1 of AA), and after about 7 min of processing with a product-to-oil ratio of 1/8 (around 260 +/- 50 [mu]g kg-1 of AA).
Keywords: Acrylamide; French fries; Fryer; Heating power; Potato-to-oil ratio; Quality; Temperature kinetics; Food safety; Food composition

David A. Booth, Physiological regulation through learnt control of appetites by contingencies among signals from external and internal environments, Appetite, Volume 51, Issue 3, November 2008, Pages 433-441, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.06.008.
(http://www.sciencedirect.com/science/article/B6WB2-4SWFNKK-1/2/e94f196701dfb84f9f20666d5222dbdd)
Abstract:
As reviewed by [Cooper, S. J. (2008). From Claude Bernard to Walter Cannon: emergence of the concept of homeostasis. Appetite 51, xxx-xxx.] Claude Bernard's idea of stabilisation of bodily states, as realised in Walter B. Cannon's conception of homeostasis, took mathematical form during the 1940s in the principle that externally originating disturbance of a physiological parameter can feed an informative signal around the brain to trigger counteractive processes - a corrective mechanism known as negative feedback, in practice reliant on feedforward. Three decades later, enough was known of the physiology and psychology of eating and drinking for calculations to show how experimentally demonstrated mechanisms of feedforward that had been learnt from negative feedback combine to regulate exchanges of water and energy between the body and the surroundings. Subsequent systemic physiology, molecular neuroscience and experimental psychology, however, have been traduced by a misconception that learnt controls of intake are `non-homeostatic', the myth of biological `set points' and an historic failure to address evidence for the ingestion-adapting information-processing mechanisms on which an operationally integrative theory of eating and drinking relies.
Keywords: Homeostasis; Negative feedback; Signals as information; Quantitative systems theory; Learnt identities of foods; Learnt sating of appetite for food

Atilla Hoefling, Fritz Strack, The tempting effect of forbidden foods. High calorie content evokes conflicting implicit and explicit evaluations in restrained eaters, Appetite, Volume 51, Issue 3, November 2008, Pages 681-689, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.06.004.
(http://www.sciencedirect.com/science/article/B6WB2-4STGRRS-1/2/9ff9d8f9cfbd55298c80bfd1d53bfc91)
Abstract:
In this study, restrained and unrestrained eaters' immediate evaluations of high calorie content and low calorie content were measured, both when being deprived of food and when satiated. As an indirect measure, the Extrinsic Affective Simon Task (EAST) [De Houwer, J. (2003). The Extrinsic Affective Simon Task. Experimental Psychology, 50, 77-85.] was used. Explicit attitudes towards high calorie content and low calorie content were also assessed. Food deprivation was found to boost the value of food for all subjects on an impulsive level of information processing. More importantly, it was also found that restrained eaters exhibit a dissociative pattern of positive implicit and negative explicit attitudes towards high calorie content, but not towards low calorie content. Furthermore, restrained eaters evaluated high calorie content more negative than unrestrained

eaters on an explicit level, but more positive on an implicit level. Results from this study are twofold. First, they suggest that conflicting evaluative reactions from two systems of information processing may play a central role in the restrained eater's dilemma. Second, individual differences between restrained and unrestrained eaters' attitudes towards high calorie content should further be investigated.
Keywords: Restrained eating; Food deprivation; Forbidden foods; Reflective Impulsive Model (RIM); Implicit versus explicit attitudes; Indirect measures; Extrinsic Affective Simon Task (EAST)

N. Zijlstra, M. Mars, A. Stafleu, R.A. de Wijk, J.F. Prinz, N.L. Huck, C. de Graaf, Effect of bite size and oral processing time of food on satiation, Appetite, Volume 51, Issue 3, November 2008, Page 753, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.05.010.
(http://www.sciencedirect.com/science/article/B6WB2-4SV12JV-9/2/e990d32bcdd4affc0ac2be49df71332b)

Guido Velten, Anja S. Rott, Beatrice J. Conde Petit, Cesar Cardona, Silvia Dorn, Improved bruchid management through favorable host plant traits and natural enemies, Biological Control, Volume 47, Issue 2, November 2008, Pages 133-140, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2008.07.009.
(http://www.sciencedirect.com/science/article/B6WBP-4T3DCVF-2/2/825224cd528e62aa470012befca73853)
Abstract:
The combination of favorable host plant traits and biological control by the parasitoid Dinarmus basalis (Rondani) has been suggested to contribute significantly to the protection of stored beans (Phaseolus vulgaris L.) from attack by Acanthoscelides obtectus (Say) and other bruchids. Physical seed parameters have previously been reported to impede penetration by neonate bruchid larvae into dry beans. However, those parameters could also affect parasitoid performance. In addition, other plant traits such as chemical seed parameters have the potential to contribute to bruchid suppression but may influence food processing. We characterized 22 bean lines in regard to physical attributes, such as seed coat thickness and cotyledon strength, and tested 10 selected lines for potential correlated effects on bruchid survival and parasitoid efficiency. Bean lines expressing the natural seed storage protein arcelin and arcelin-free cultivars were compared regarding their hydration kinetics. Bioassay results showed that increasing seed coat thickness and cotyledon strength did not reduce bruchid penetration into the seeds, indicating that the survival of neonate bruchid larvae does not depend on their individual capability to pierce a seed. Introduction of parasitoids yielded only few parasitoid offspring, but resulted in increased post-penetration mortality of bruchids in samples with arcelin containing bean lines. This finding is discussed in the context of host feeding. Comparisons of hydration kinetics of arcelin containing and arcelin-free beans yielded no significant differences in water absorption rate and hydration capacity. The present work corroborates earlier evidence that the natural storage protein arcelin is a promising component for integrated storage systems and demonstrates that it does not detectably alter the cooking quality of dry beans.
Keywords: Phaseolus vulgaris; Bruchidae; Acanthoscelides obtectus; Zabrotes subfasciatus; Parasitoid; Dinarmus basalis; Plant resistance; Integrated pest management; Food processing

Gary A. Lehrsch, Charles W. Robbins, Melvin J. Brown, Whey utilization in furrow irrigation: Effects on aggregate stability and erosion, Bioresource Technology, Volume 99, Issue 17, November 2008, Pages 8458-8463, ISSN 0960-8524, DOI: 10.1016/j.biortech.2008.02.050.
(http://www.sciencedirect.com/science/article/B6V24-4SBYYD5-3/2/fd1c176dfb97ed4409092c5c35fa7c3b)
Abstract:

Improving soil structure often reduces furrow erosion and maintains adequate infiltration. Cottage cheese whey, the liquid byproduct from cottage cheese manufacture, was utilized to stabilize soil aggregates and reduce sediment losses from furrow irrigation. We applied either 2.4 or 1.9 L of whey per meter of furrow (3.15 or 2.49 L m-2, respectively) by gravity flow without incorporation to two fields of Portneuf silt loam (Durinodic Xeric Haplocalcid) near Kimberly, ID. Furrows were irrigated with water beginning four days later. We measured sediment losses with furrow flumes during each irrigation and measured aggregate stability by wet sieving about 10 days after the last irrigation. Overall, whey significantly increased aggregate stability 25% at the 0-15 mm depth and 14% at 15-30 mm, compared to controls. On average, whey reduced sediment losses by 75% from furrows sloped at 2.4%. Whey increased the aggregate stability of structurally degraded calcareous soil in irrigation furrows.
Keywords: Aggregate stability; Food processing byproducts; Waste utilization; Acid whey; Furrow erosion

Lovedeep Kaur, Jaspreet Singh, Harjinder Singh, Owen J. McCarthy, Starch-cassia gum interactions: A microstructure - Rheology study, Food Chemistry, Volume 111, Issue 1, 1 November 2008, Pages 1-10, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.03.027.
(http://www.sciencedirect.com/science/article/B6T6R-4S21TT4-4/2/f677ec41f7b5197299c1b92594afb6a3)
Abstract:
We present for the first time the interactions of starch and cassia gum - a novel galactomannan recently approved for use in food processing. Viscoelastic, pasting and microstructural characterization of various starches (waxy; high amylose; normal; cross-linked waxy corn starch; potato starch) containing different levels of the cassia gum was carried out. Significant changes were observed in the morphology of granule remnants formed during gelatinization in the starch pastes prepared with and without the addition of cassia gum. The freeze-dried starch-cassia gum pastes presented a shrunken and tight arrangement of the starch granule remnants, when studied by scanning electron microscopy. A significant reduction in the granule remnant size was also calculated using laser diffraction particle size analysis. The extent of interaction with cassia gum differed significantly among the various starch types. All the unmodified corn starches recorded an increase in peak viscosity at all levels of the cassia gum addition. An increase in the final viscosity of these starches was also observed by the addition of cassia gum, with high amylose and normal corn starch showing the maximum. Similarly, the extent of breakdown and setback viscosity also differed among the different starch types. Ranges of dynamic rheological measurements (temperature, time and frequency sweeps) were performed within the viscoelastic zones. Rheological parameters, such as storage modulus (G'), loss modulus (G") and the gelatinization temperature (Tgel), of the corn starches during the heating cycle were observed to increase, when cassia gum was present at lower levels. The starch-gum systems also exhibited higher tan [delta] values during both the heating and the cooling cycles, indicating the dominance of the viscous modulus. The G' and G" of all the corn starch gels containing cassia gum showed higher values throughout the frequency sweep range. However, the increase in G' and G" of different starches was not always consistent with the increase in cassia gum levels. The changes in rheological behaviour during storage of the starch gels, aged on the plate of the rheometer and then studied through time sweeps at 5 [degree sign]C and frequency sweeps at 25 [degree sign]C, suggested that the starch gels containing cassia gum had less pronounced changes in the rheological parameters than had their control counterparts.
Keywords: Starch; Cassia gum; Microstructure; Rheology; Pasting; Characterization

R. Simpson, A. Abakarov, A. Teixeira, Variable retort temperature optimization using adaptive random search techniques, Food Control, Volume 19, Issue 11, November 2008, Pages 1023-1032, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.10.010.

(http://www.sciencedirect.com/science/article/B6T6S-4R29FHN-1/2/0737e30f5b3bcc29a1a76ff8095fe7da)
Abstract:
Global optimization algorithms and software based on adaptive random search techniques show considerable promise as more rapid and efficient approach to process optimization in the food industry. This paper describes use of the method in finding optimum variable retort temperature profiles that would maximize quality retention or minimize process time without compromising target lethality or minimum required quality retention in the case of thermal processing of canned foods. Results agreed well with those previously published by others who used more traditional approaches for similar optimization problems. Results also showed that the method lent itself well to the use of a cubic spline approximation for the dynamic temperature profiles, thereby reducing significantly the number of variables and dimensional space of the problem, in contrast to other methods, while producing superior results.
Keywords: Random search; Global optimization; Process optimization; Thermal process

Thava Vasanthan, Feral Temelli, Grain fractionation technologies for cereal beta-glucan concentration, Food Research International, Volume 41, Issue 9, Cereal Foods, November 2008, Pages 876-881, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.07.022.
(http://www.sciencedirect.com/science/article/B6T6V-4T7086B-1/2/89aa202425d4ef01af35f043d61149da)
Abstract:
Mixed linkage beta-glucan is a cell wall component of cereal grains such as oat and barley. A number of nutritional studies have demonstrated a link between the regular consumption of foods containing cereal beta-glucan at physiologically effective concentrations and a reduced risk of chronic health problems. However, since beta-glucan exists in lower concentrations in grains, its incorporation into regular foods at physiologically effective levels without compromising the sensory attributes of foods has been a problem. Therefore, industry interest has been growing to produce beta-glucan concentrates. This article reviews the different types of dry and wet technologies available for concentration of cereal beta-glucan with a focus on commercial scale processing and their impact on the physicochemical properties of beta-glucan.
Keywords: Oat; Barley; Soluble fiber; Health benefits; Milling and air-classification; Aqueous process; Semi-alcoholic process; Enzymes; Thermo-mechanical

Bin Xiao Fu, Asian noodles: History, classification, raw materials, and processing, Food Research International, Volume 41, Issue 9, Cereal Foods, November 2008, Pages 888-902, ISSN 0963-9969, DOI:10.1016/j.foodres.2007.11.007.
(http://www.sciencedirect.com/science/article/B6T6V-4R8NB7X-2/2/0f5bd3787dc16632dfdf4c1b17623bb2)
Abstract:
Noodles in various contents, formulations, and shapes have been the staple foods for many Asian countries since ancient time. They can be made from wheat, rice, buckwheat, and starches derived from potato, sweet potato, and pulses. Noodles based on wheat are prepared mainly from three basic ingredients; flour, water, and salt. There exist two distinct types of wheat flour noodles based on the presence and absence of alkaline salts, regular salted noodles, and alkaline noodles. The basic process of dough mixing, sheet forming, compounding, sheeting/reduction, and cutting are essentially constant for all machine-made noodles. Noodle strands coming out of cutting rolls can be further processed to produce different types of noodles. This article analyzed all the major processes involved from raw material to finished products in relation to noodle processing properties and cooked noodle texture. Different ingredients and their functionality in noodle processing were discussed as well. Guidelines were provided to select the right ingredients to produce high quality noodle products. Processing properties, appearance, and colour of noodles

are the three key criteria used to judge a process and raw material quality. High quality noodles should be bright in colour with very slow discoloration, have an adequate shelf life without visible microbiological deterioration or oxidative rancidity, and have appropriate flavour and textural characteristics which will vary according to the noodle type and region. Flour plays a key role in all aspects of noodle quality. Protein content is positively correlated with noodle firmness and sometimes negatively correlated with elasticity. Therefore, a correct range of protein content is important for textural characteristics. Adequate gluten strength and extensibility is required in all noodle flours. Noodle dough must be strong enough to withstand sheeting, but not so strong as to cause tearing or difficulty in sheet reduction. A good level of dough extensibility ensures that dough sheets do not shrink back during successive roll passes. The importance of the pasting properties of starch to the texture of cooked noodles has been well-documented. The required soft, smooth, and elastic textural properties of certain types of white salted noodles can be best obtained from wheats with high starch paste viscosity and high swelling starch properties. Alkaline noodles do not have the same requirement for high starch swelling properties. Noodles made from flour with high swelling starches have softer texture than those with low swelling starch. Noodles should be bright and slow in discoloration with time after manufacturing. For white salted noodles, a white or creamy white colour is desirable. The level of natural yellow pigment levels (xanthophylls) in flour is highly correlated with noodle colour, and this is wheat variety dependent. For yellow alkaline noodles, a bright yellow colour is required, although the preference for the degree of colour development is regionally based. Noodle darkening increases with the increases of flour extraction rate. This is due to the action of polyphenol oxidase (PPO) enzymes which are largely located in the bran layer. Low flour extraction and ash levels are preferred for the manufacture of noodles with a clean and bright appearance. A relatively fine flour particle size enables even hydration during mixing and optimum, uniform gluten development during sheeting. Increased starch damage, however, is associated with poor noodle colour and undesirable high cooking loss and excessive surface swelling.
Keywords: Noodles; Processing; Wheat flour

Petra Hogy, Andreas Fangmeier, Effects of elevated atmospheric CO2 on grain quality of wheat, Journal of Cereal Science, Volume 48, Issue 3, November 2008, Pages 580-591, ISSN 0733-5210, DOI: 10.1016/j.jcs.2008.01.006.
(http://www.sciencedirect.com/science/article/B6WHK-4S1S6HX-2/2/465f1b6b983168e6383977189180547d)
Abstract:
Wheat (Triticum aestivum L.) is one of the most important agricultural crops worldwide. Due to its high content of starch and unique gluten proteins, wheat grain is used for many food and non-food applications. Although grain quality is an important topic for food and feed as well as industrial processing, the consequences of future increases in atmospheric carbon dioxide (CO2) concentrations on quality parameters such as nutritional and bread-making rheological properties are still unclear. Wheat productivity increases under CO2 enrichment. Concomitantly, the chemical composition of vegetative plant parts is often changed and grain quality is altered. In particular, the decrease in grain protein concentration and changes in protein composition may have serious economic and health implications. Additionally, CO2 enrichment affects amino acid composition and the concentrations of macro- and micro-elements. However, experimental results are often inconsistent. The present review summarises the results from numerous CO2 enrichment experiments using different exposure techniques in order to quantify the potential impacts of projected atmospheric CO2 levels on wheat grain yield and on aspects of grain composition relevant to processing and human nutrition.
Keywords: CO2 enrichment; Wheat; Grain yield; Grain quality

S. Cafieri, S. Chillo, M. Mastromatteo, N. Suriano, M.A. Del Nobile, A mathematical model to predict the effect of shape on pasta hydration kinetic during cooking and overcooking, Journal of Cereal Science, Volume 48, Issue 3, November 2008, Pages 857-862, ISSN 0733-5210, DOI: 10.1016/j.jcs.2008.06.010.
(http://www.sciencedirect.com/science/article/B6WHK-4T5CGS6-3/2/9ffc4f768d8a8a1607779f6c895b892e)
Abstract:
In this paper, a novel mathematical model to describe pasta hydration kinetic during cooking and overcooking is presented. The model takes into account the water diffusion process, the relaxation of the macromolecular matrix and the starch gelatinization process. The target pasta samples have three different geometries, specifically plane sheet, solid cylinder and hollow cylinder. The proposed model satisfactorily fits the experimental data, showing its ability to predict hydration kinetics for all the considered geometries. It is also successfully applied to predict the evolution of water concentration profiles.
Keywords: Modeling; Hydration kinetic; Food processing

Stephen W.C. Chung, K.P. Kwong, Joan C.W. Yau, Anna M.C. Wong, Y. Xiao, Chloropropanols levels in foodstuffs marketed in Hong Kong, Journal of Food Composition and Analysis, Volume 21, Issue 7, November 2008, Pages 569-573, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.04.010.
(http://www.sciencedirect.com/science/article/B6WJH-4SGD4PS-2/2/b2ba62180034da88a78d5426d1dc7098)
Abstract:
Chloropropanols, 3-monochloropropan-1,3-diol (3-MCPD) and 1,3-dichloropropanol (1,3-DCP), have been interested globally in recent years. 3-MCPD was also reported in food as a result of heat processing, as well as other processing or storage conditions. As such, 318 samples from different indigenous food items were collected from the retail market in Hong Kong and determined the content of the chloropropanols. Chloropropanols were not detected in most of the commonly consumed food items. 3-MCPD was found in 101 food samples (32%) with levels ranged from 3 to 66 [mu]g/kg. Among others, the highest content of 3-MCPD was found in a snack sample, ready-to-eat seaweed, which has not been reported in other similar findings. Only 15 food samples (5%) were found to contain 1,3-DCP ranged from 1.0 to 9.5 [mu]g/kg. An indigenous food, roasted pork, sample got the highest level of 1,3-DCP. This study also showed that cooking process of frying would produce higher levels of chloropropanols than steaming.
Keywords: 3-MCPD; 1, 3-DCP; Foodstuff; Hong Kong, GC-MS

Aylin Altan, Kathryn L. McCarthy, Medeni Maskan, Twin-screw extrusion of barley-grape pomace blends: Extrudate characteristics and determination of optimum processing conditions, Journal of Food Engineering, Volume 89, Issue 1, November 2008, Pages 24-32, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.03.025.
(http://www.sciencedirect.com/science/article/B6T8J-4S73R9H-1/2/810217207f7774d6e4d1e2e523f18823)
Abstract:
The barley flour-grape pomace blends were extruded in a 30 mm APV co-rotating twin-screw extruder. Response surface methodology using a central composite design was used to evaluate the effects of independent variables, namely die temperature (140-160 [degree sign]C), screw speed (150-200 rpm) and pomace level (2-10%, db) on product responses (expansion, bulk density, texture and color). Sensory analysis was carried out for selected extrudates for appearance (color, porosity), taste (bran flavor, bitterness and sweetness), off-odor, texture (hardness, crispness and brittleness) and overall acceptability. Multiple regression equations were obtained to describe the effects of each variable on product responses. The product responses were most affected by changes in temperature, pomace level and to a lesser extent by screw

speed. Blends of 2% grape pomace extruded at 160 [degree sign]C, 200 rpm and 10% grape pomace extruded at 160 [degree sign]C, 150 rpm had higher preference levels for parameters of appearance, taste, texture and overall acceptability. However, graphical optimization studies resulted in 155-160 [degree sign]C, 4.47-6.57% pomace level and 150-187 rpm screw speed as optimum variables to produce acceptable extrudates. The results suggest that grape pomace can be extruded with barley flour into an acceptable snack food.
Keywords: Extrusion cooking; Barley; Grape pomace; Response surface methodology; Optimization

H.-J. Chung, S.L. Birla, J. Tang, Performance evaluation of aluminum test cell designed for determining the heat resistance of bacterial spores in foods, LWT - Food Science and Technology, Volume 41, Issue 8, November 2008, Pages 1351-1359, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.08.024.
(http://www.sciencedirect.com/science/article/B6WMV-4PKPH3P-2/2/73ff7ae62fb6a29d058680e30ebc16bb)
Abstract:
Thermal inactivation kinetic studies are necessary to determine heat resistances of spores in the development of new thermal processes for low-acid shelf-stable products. Most currently available sample holders used for solid and semi solid samples in the kinetic studies take long time to reach the target sample temperature, hence fail to provide isothermal condition. In this research, novel aluminum test cells were developed to facilitate easy loading and unloading samples in a hermetically sealed 1 ml cavity to evaluate the heat resistance of bacterial spores when heated at temperatures above 100 [degree sign]C. Design of the test cell was governed by minimum come-up time. A finite element model based on the commercial software `FEMLAB' was used to simulate transient heat transfer and finalize the test cell dimensions. Performance of the new test cell was evaluated against capillary and aluminum thermal death time tube methods in characterizing the heat resistance of Clostridium sporogenes PA 3679 spores in a phosphate buffer and mashed potato at 121 [degree sign]C. D121 values of PA 3679 spores in both the phosphate buffer and mashed potato using the new test cells were not significantly different ($P>0.05$) from those by the capillary tube method. The results indicated that the new test cell is appropriate for studying the inactivation kinetics of bacterial spores in microbial validation of conventional and novel thermal processes for low-acid shelf-stable foods.
Keywords: Heat resistance; Inactivation kinetics; Thermal death time; Heat transfer; Finite element; Microbial validation; Thermal processing; Low-acid foods

Hongjie An, Hongshun Yang, Zhongdong Liu, Zhizhou Zhang, Effects of heating modes and sources on nanostructure of gelatinized starch molecules using atomic force microscopy, LWT - Food Science and Technology, Volume 41, Issue 8, November 2008, Pages 1466-1471, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.08.026.
(http://www.sciencedirect.com/science/article/B6WMV-4PMJK70-3/2/a7505d9e3e96ff827757fe56d655007f)
Abstract:
Potato and corn starches were subjected to convective and microwave heating. The effects of microwave heating on nanostructure of starch molecules were studied by atomic force microscopy (AFM). Potato starches formed networks with the height from 0.3 to 11.0 nm under microwave radiation. Chains were observed dissociated from the networks with a nanoparticle head. Starch chains can be rod-like conformations or thinner linear structures on nanometer scale. Rod-like chains were about 1.0 nm in height, while the thinner chains were about 0.3 nm. However, corn starches did not show any networks under microwave processing. The capped chains of corn starches were similar to those of potato starches. The results revealed that microwave heating caused incomplete gelatinization of starch by comparison with convective heating. Heating modes

influence the potato starch much than that on corn starch. The results can be applied on material selection for microwaved food development.
Keywords: Nanostructure; Atomic force microscopy (AFM); Microwave; Potato starch; Corn starch

I.T. Kadim, O. Mahgoub, R.W. Purchas, A review of the growth, and of the carcass and meat quality characteristics of the one-humped camel (Camelus dromedaries), Meat Science, Volume 80, Issue 3, November 2008, Pages 555-569, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2008.02.010.
(http://www.sciencedirect.com/science/article/B6T9G-4RW43CS-2/2/a38998aec78f1e4d0b399e0a2d1f1b81)
Abstract:
The dromedary camel is a good source of meat especially in areas where the climate adversely affects the performance of other meat animals. This is because of its unique physiological characteristics, including a great tolerance to high temperatures, solar radiation, water scarcity, rough topography and poor vegetation. The average birth weight of camels is about 35 kg, but it varies widely between regions, breeds and within the same breed. The meat producing ability of camels is limited by modest growth rates (500 g/day). However, camels are mostly produced under traditional extensive systems on poor levels of nutrition and are mostly slaughtered at older ages after a career in work, racing or milk production. Camels reach live weights of about 650 kg at 7-8 years of age, and produce carcass weights ranging from 125 to 400 kg with dressing-out percentage values from 55% to 70%. Camel carcasses contain about 57% muscle, 26% bone and 17% fat with fore halves (cranial to rib 13) significantly heavier than the hind halves. Camel lean meat contains about 78% water, 19% protein, 3% fat, and 1.2% ash with a small amount of intramuscular fat, which renders it a healthy food for humans. Camel meat has been described as raspberry red to dark brown in colour and the fat of the camel meat is white. Camel meat is similar in taste and texture to beef. The amino acid and mineral contents of camel meat are often higher than beef, probably due to lower intramuscular fat levels. Recently, camel meat has been processed into burgers, patties, sausages and shawarma to add value. Future research efforts need to focus on exploiting the potential of the camel as a source of meat through multidisplinary research into efficient production systems, and improved meat technology and marketing.
Keywords: Camel; Meat quality; Nutritive value; Meat composition; Meat processing

John Chr. Larsen, Legal and illegal colours, Trends in Food Science & Technology, Volume 19, Supplement 1, EFSA Forum: From Safe Food to Healthy Diets, November 2008, Pages S64-S69, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.07.008.
(http://www.sciencedirect.com/science/article/B6VHY-4TVSXWN-8/2/dbb657d516c1fd0e55b51f5372ccb758)
Abstract:
Food additives are evaluated by the European Food Safety Authority's (EFSA) Scientific Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food (the AFC Panel). The AFC Panel is supported by its standing working group on food additives (WG ADD), which prepares draft opinions on food additives, including colours, and on the bioavailability and safety of nutrient sources. The WG ADD consists of several members from the AFC Panel together with selected external experts. The draft opinions go forward to the AFC Panel for discussion and final adoption. The adopted opinions are published on the EFSA web site. During its first 5 years of existence the AFC Panel has experienced the highest workload of all EFSA Panels, of which evaluations of food additives have been a substantial part. Although the AFC Panel has issued many opinions on food additives, some of which have been widely debated, such as opinions on aspartame [EFSA. (2006). Opinion of the Scientific Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food (AFC) related to a new long-term carcinogenicity study on aspartame. Opinion expressed on 03/05/2006. Available at

http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178620765743.htm. Accessed 12.05.08.] and parabens [EFSA. (2004). Opinion of the Scientific Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food (AFC) related to para hydroxybenzoates (214e219). Opinion expressed on 13/07/2004. Available at http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178620761956.htm. Accessed 12.05.08.] this paper only deals with some of the major issues that the Panel has faced in relation to the use of food colours. The three topics to be dealt with are (1) evaluation of illegal colours in food in the EU (EFSA, 2005), (2) re-evaluation of the authorised food colours in the EU (ongoing, but one opinion on Red 2G has been published; EFSA, 2007), and (3) evaluation of 'the Southampton study' on hyperactivity in children after intake of food colours (and sodium benzoate) (ongoing at the time of this presentation, but an opinion has now been published; EFSA, 2008).

Jianfen Liang, Bei-Zhong Han, M.J. Robert Nout, Robert J. Hamer, Effects of soaking, germination and fermentation on phytic acid, total and in vitro soluble zinc in brown rice, Food Chemistry, Volume 110, Issue 4, 15 October 2008, Pages 821-828, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.02.064.
(http://www.sciencedirect.com/science/article/B6T6R-4RY6WXM-1/2/0e5a307b78c8d9f9c8f12191eee0beb1)
Abstract:
Rice is an important staple food in Asian countries. In rural areas it is also a major source of micronutrients. Unfortunately, the bioavailability of minerals, e.g. zinc from rice, is low because it is present as an insoluble complex with food components such as phytic acid. We investigated the effects of soaking, germination and fermentation with an aim to reduce the content of phytic acid, while maintaining sufficient levels of zinc, in the expectation of increasing its bioavailability. Fermentation treatments were most effective in decreasing phytic acid (56-96% removal), followed by soaking at 10 [degree sign]C after preheating (42-59%). Steeping of intact kernels for 24 h at 25 [degree sign]C had the least effect on phytic acid removal (<20%). With increased germination periods at 30 [degree sign]C, phytic acid removal progressed from 4% to 60%. Most wet processing procedures, except soaking after wet preheating, caused a loss of dry mass and zinc (1-20%). In vitro solubility, as a percentage of total zinc in soaked rice, was significantly higher than in untreated brown rice while, in steeped brown rice, it was lower ($p < 0.05$). Fermentation and germination did not have significant effects on the solubility of zinc. The expected improvement due to lower phytic acid levels was not confirmed by increasing levels of in vitro soluble zinc. This may result from zinc complexation to other food components.
Keywords: Soaking; Germination; Fermentation; In vitro solubility; Phytic acid; Zinc

Evelien L. van Boxtel, Stef J. Koppelman, Lambertus A.M. van den Broek, Harry Gruppen, Heat denaturation of Brazil nut allergen Ber e 1 in relation to food processing, Food Chemistry, Volume 110, Issue 4, 15 October 2008, Pages 904-908, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.02.078.
(http://www.sciencedirect.com/science/article/B6T6R-4S03RKK-4/2/d5b52f56b60116c7a1f38fc0841ccc68)
Abstract:
Ber e 1, a major allergen from Brazil nuts, is very stable to in vitro peptic digestion. As heat-induced denaturation may affect protein digestibility, the denaturation behaviour of Ber e 1 was investigated. The denaturation temperature of Ber e 1 varies from approximately 80-110 [degree sign]C, depending on the pH. Upon heating above its denaturation temperature at pH 7.0, the protein partly forms insoluble aggregates and partly dissociates into its polypeptides, whereas heating at pH 5.0 does neither induce aggregation, nor dissociation of the protein. The denaturation temperature of approximately 110 [degree sign]C at pH values corresponding to the general pH values of foods (pH 5-7) is very high and is expected to be even higher in Brazil nuts

themselves. As a result, it is unlikely that heat processing causes the denaturation of all Ber e 1 present in food products. Consequently, the allergen is assumed to be consumed (mainly) in its native form, having a high stability towards pepsin digestion.
Keywords: Food allergy; Ber e 1; Brazil nuts; Heat denaturation

C. Igathinathane, L.O. Pordesimo, E.P. Columbus, W.D. Batchelor, S.R. Methuku, Shape identification and particles size distribution from basic shape parameters using ImageJ, Computers and Electronics in Agriculture, Volume 63, Issue 2, October 2008, Pages 168-182, ISSN 0168-1699, DOI: 10.1016/j.compag.2008.02.007.
(http://www.sciencedirect.com/science/article/B6T5M-4S86217-1/2/232fc26e1eb5b1466fb47354763bcafc)
Abstract:
Quick and accurate particle size distribution analysis is desirable in various technical fields that handle granular or particulate materials including size reduction. We developed an ImageJ plugin that extracts the dimensions from a digital image of disjoint particles after identifying their shapes and determines their particles size distribution. We established that the major and minor axes of ImageJ fitted ellipse along with the developed correction factors efficiently determined dimensions of particles. This paper describes the plugin development and its application to food grains and ground biomass. Using computer generated geometrical shapes as reference objects, a shape identification strategy that addresses common geometric shapes such as square, inclined square, rectangle, inclined rectangle, circle, ellipse, and inclined ellipse was developed. The strategy used only three newly defined shape parameters to identify objects, such as reciprocal aspect ratio, rectangularity, and feret major axis ratio from the standard outputs generated by ImageJ. Evaluation of effects of the particles shape, size, and orientation on the deviation from the reference particle's length and width indicated that the mean absolute deviations of all these factors were less than 1.3%. Developed plugin was applied successfully to analyze the dimensions and size distribution of food grains and ground Miscanthus particles images. The plugin produced quick and accurate size distribution of particles from digital images and can be applied to variety of particle analysis applications.
Keywords: ImageJ; Image processing; Machine vision; Physical properties; Plugin; Shape identification

F. Naim, M.R. Zareifard, S. Zhu, R.H. Huizing, S. Grabowski, M. Marcotte, Combined effects of heat, nisin and acidification on the inactivation of Clostridium sporogenes spores in carrot-alginate particles: From kinetics to process validation, Food Microbiology, Volume 25, Issue 7, October 2008, Pages 936-941, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.06.005.
(http://www.sciencedirect.com/science/article/B6WFP-4SR7149-2/2/e73fb4a33358ac74a0f125b520218484)
Abstract:
Combined effects of mild temperatures, acidification and nisin on the thermal resistance of Clostridium sporogenes ATCC 11437 spores were assessed. Inoculated carrot-alginate particles were used as a solid-food model for the validation of the spore inactivation during the flow of a solid-liquid food system through the holding tube of an aseptic processing unit. Inactivation kinetics was studied in a water bath with the spores inoculated into carrot-alginate particles and in Sorensen's phosphate buffer. For temperatures of 70-90 [degree sign]C, D-values in the buffer were 24.9-5.7 min, much lower than those evaluated for the particles (115.1-22.2 min). Statistical analyses showed significant synergistic effects of temperature and pH on spore inactivation for both media. Acidification reduced the heat resistance of the spores by reducing the D-values. Nisin was not significantly effective at the lower concentrations (up to 750 IU/g). The combination of 90 [degree sign]C, pH: 4.5 and 500 IU/g nisin resulted in a ten-fold decrease of the D-value for spores inoculated in the particles (from 111.1 to 10.6 min). Microbial validation tests were conducted

using a pilot-scale aseptic processing unit with a mixture of carrot cubes (10%) and carrier liquid of 2%-carboxymethylcellulose solution (90%). Spore-inoculated carrot-alginate particles (initial counts of 106 CFU/g, obtained after come-up-time pre-heat) with pH 3.5 and 2000 IU/g nisin were processed at 90 [degree sign]C in the aseptic processing unit. Microbial analysis showed no spore survivors in the particles after passing through the holding tube (5.2-6.0 min of residence time). The proposed combination of these hurdles significantly enhanced the spore inactivation rate (D90=1.17 min) as compared to that for thermal treatment only (D90=19.6 min).
Keywords: Thermal inactivation; C. sporogenes; ATCC 11437; Spores; Hurdles; Acidification; Nisin; Carrot-alginate particles; Aseptic processing; Validation

G.S. Ladics, Current codex guidelines for assessment of potential protein allergenicity, Food and Chemical Toxicology, Volume 46, Issue 10, Supplement 1, The Utility of an International Sera Bank for Use in Evaluating the Potential Human Allergenicity of Novel Proteins - HESI Workshop, Seoul, South Korea, April 25-27, 2006, October 2008, Pages S20-S23, ISSN 0278-6915, DOI: 10.1016/j.fct.2008.07.021.
(http://www.sciencedirect.com/science/article/B6T6P-4T3M6CW-5/2/9bd4b1446cc9230561ddf547c80dd8c0)
Abstract:
A rigorous safety assessment process exists for GM crops. It includes evaluation of the introduced protein as well as the crop containing such protein with the goal of demonstrating the GM crop is 'as-safe-as' non-transgenic crops in the food supply. One of the major issues for GM crops is the assessment of the expressed protein for allergenic potential. Currently, no single factor is recognized as an identifier for protein allergenicity. Therefore, a weight-of-evidence approach, which takes into account a variety of factors and approaches for an overall assessment of allergenic potential, is conducted [Codex Alimentarious Commission, 2003. Alinorm 03/34: Joint FAO/WHO Food Standard Programme, Codex Alimentarious Commission, Twenty-Fifth Session, Rome, Italy, 30 June-5 July, 2003. Appendix III, Guideline for the conduct of food safety assessment of foods derived from recombinant-DNA plants, and Appendix IV, Annex on the assessment of possible allergenicity, pp. 47-60]. This assessment is based on what is known about allergens, including the history of exposure and safety of the gene(s) source; protein structure (e.g., amino acid sequence identity to human allergens); stability to pepsin digestion in vitro [Thomas, K. et al., 2004. A multi-laboratory evaluation of a common in vitro pepsin digestion assay protocol used in assessing the safety of novel proteins. Regul. Toxicol. Pharmacol. 39, 87-98]; an estimate of exposure of the novel protein(s) to the gastrointestinal tract where absorption occurs (e.g., protein abundance in the crop, processing effects); and when appropriate, specific IgE binding studies or skin prick testing. Additional approaches may be considered (e.g., animal models; targeted sera screening) as the science evolves; however, such approaches have not been thoroughly evaluated or validated for predicting protein allergenicity.
Keywords: Protein allergenicity; Genetically modified crops; CODEX guidelines; Weight-of-evidence

D. Gerlach, N. Alleborn, A. Baars, A. Delgado, J. Moritz, D. Knorr, Numerical simulations of pulsed electric fields for food preservation: A review, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 408-417, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.02.001.
(http://www.sciencedirect.com/science/article/B6W6D-4S01VH7-1/2/f1cc71cdccb76a31fe1f48da013f0c6c)
Abstract:
The application of pulsed electric fields is a novel technique to preserve foods in a non-thermal way. One key component of this technology is the treatment chamber, in which the food is exposed to a pulsed electric field to induce permeabilization of biological cells, e.g. to inactivate

microorganisms. For a high efficiency of the method and a high product quality a detailed knowledge of the electric field strength and temperature distribution in the chamber is necessary. The numerical simulation of the fluid dynamics coupled with the electric and thermal fields inside the treatment chamber can provide such information with high spacial and temporal resolution. An important goal of the simulations is the optimization of the treatment chamber geometry to improve the uniformity of the electric and thermal fields between the electrodes in order to avoid the over or under-processing of foods or dielectric breakdowns. This article reviews numerical investigations performed on the pulsed electric field process and presents numerical results of a treatment chamber optimization and the solution of coupled fluid dynamical, electrical and thermal problems.Industrial relevance:
Numerical simulations of the pulsed electric field process provide detailed information of the fluid flow, the temperature and the electric field distributions in treatment chambers under various conditions. Such local information inside the electric field is difficult to obtain experimentally. For a further development of the pulsed electric field technology, numerical simulations can be applied to improve the fundamental understanding of the physical phenomena occurring and to optimize the process with respect to the chamber design and operating conditions.
Keywords: Numerical simulation; Pulsed electric field; PEF; Food preservation; Non-thermal processing

Xin An Zeng, Shu Juan Yu, Lu Zhang, Xiao Dong Chen, The effects of AC electric field on wine maturation, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 463-468, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.03.002.
(http://www.sciencedirect.com/science/article/B6W6D-4S7BDGS-1/2/4d2d0762c4990247765863d2cf6978a4)
Abstract:
A pilot plant scale innovative technique applying AC high voltage electric field to accelerate wine aging of Young Cabernet Sauvignon is reported in this paper. The design principles, equipment configuration and its effect on wine taste and flavour are presented. Results from a sensory evaluation group demonstrated that there were various effects on the wine quality under different conditions, some positive while others negative. An optimum treatment, with electric field 600 V/cm and treatment time 3 min, was identified to accelerate wine aging, which made the harsh and pungent raw wine become harmonious and dainty. HPLC and GC/MS combined with routine chemical analysis methods were used to identify the differences between the treated and untreated samples. It was found that the contents of higher alcohols as well as aldehydes in volatile compounds decreased to a large number, meanwhile, the contents of esters and free amino acids slightly increased while others remained unchanged through all treatments. The results of this study show that the technology of accelerating wine aging by high voltage electric field is a feasible method to shorten wine maturing process times and to improve the quality of a young wine, if favourable process conditions are chosen.Industrial relevance
The application of physical treatment methods other than heat, such as electric field, magnetic field, ultrasonic wave and microwave, etc., for green processing of foods, is becoming popular. AC electric current is of continuous wave form, thus being seldom used in food processing. However, numerous previous studies about the effect and mechanisms of accelerating wine aging with high voltage AC electric field have been conducted in the Laboratory of South China University of Technology. This manuscript presents the effect of high intensity AC electric field on young wine's physicochemical properties and sensory quality. The results presented in this paper show that it is a promising and novel technology to shorten the young wine's aging period. Recently, a few of the Chinese winery companies have already started to set up the plant scale equipment.
Keywords: High voltage electric field; Wine; Accelerate aging

Rui M.S. Cruz, Margarida C. Vieira, Cristina L.M. Silva, Effect of heat and thermosonication treatments on watercress (Nasturtium officinale) vitamin C degradation kinetics, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 483-488, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.10.005.
(http://www.sciencedirect.com/science/article/B6W6D-4R466FG-1/2/e009283124b188b5d0ec86059f96edde)
Abstract:
The use of ultrasound in food processing creates novel and interesting methodologies, which are often complementary to classical techniques. In this work, the effect of heat and the combined treatment heat/ultrasound (thermosonication) on the thermal degradation kinetics of vitamin C in watercress (Nasturtium officinale) was studied in the temperature range of 82.5 to 92.5 [degree sign]C. First order reaction kinetics adequately described the vitamin C losses during both blanching processes.
The activation energies and the reaction rates at 87.5 [degree sign]C for heat (H) and thermosonication (Ts) treatments were, respectively, EavitCH = 150.47 +/- 42.81 kJ mol- 1 and EavitCTs = 136.20 +/- 60.97 kJ mol- 1, and k87.5 [degree sign]CvitCH = 0.75 +/- 0.10 min- 1 and k87.5 [degree sign]CvitCTs = 0.58 +/- 0.11 min- 1. No significant differences (P > 0.05) were detected between both treatments. The thermosonication treatment was found to be a better blanching process, since it inactivates watercress peroxidase at less severe blanching conditions and consequently retains vitamin C content at higher levels. The present findings will help to optimise the blanching conditions for the production of a new and healthy frozen product, watercress, with heat and a new blanching process methodology.Industrial relevance
Thermosonication blanching can be useful since it reduces processing times, and consequently minimizes the adverse effects of heating on watercress quality. This new application will provide good material, in terms of vitamin C, for further processes, and can be an excellent alternative to the traditional heat treatment.
Keywords: Watercress; Heat blanching; Thermosonication; Vitamin C; Kinetics modelling

Uri Lesmes, J. Barchechath, Eyal Shimoni, Continuous dual feed homogenization for the production of starch inclusion complexes for controlled release of nutrients, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 507-515, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.12.008.
(http://www.sciencedirect.com/science/article/B6W6D-4RJRVPR-2/2/4fe290b8fa7a442af653504b24179e0a)
Abstract:
The use of food grade biopolymers, such as starch, has been suggested as a technological solution for the controlled delivery of health promoting ingredients. This staple food carbohydrate may form molecular inclusion complexes, termed V-amylose, with numerous ligands. This study aimed to develop and assess a continuous production process for the formation of such complexes using three starches varying in the amylose:amylopectin ratio. The heart of the technique is the use of dual feed homogenizer for in situ complexation in accord with homogenization, to form micron and sub micron particles. Results show that pre-dissolving high amylose corn starch or corn starch in a hot alkali solution leads to the formation of a bi-modal population of 0.04-20 [mu]m or a mixed population of 0.04-3 [mu]m V-type particles, respectively. These stearic acid-loaded particles exhibit V-type X-ray diffraction and release the stearic acid mainly upon pancreatic amylases treatment. This technology could prospectively be used in numerous applications including as a delivery system for the controlled delivery of bioactives.Industrial relevance
Introduction of nutraceuticals and bioactive nutrients into foods is a major technological challenge since many of these compounds have low chemical stability during product processing, storage and consumption. One of the industrial approaches to overcome this drawback is the use of

encapsulation technologies, mainly with cheap, common and safe food ingredients. This study describes a unique continuous process to exploit starches' natural and spontaneous tendency to form single helical molecular inclusion complexes, termed V-amylose, as a possible platform for nano and micro-encapsulation. This process involves coupling pH titration, which induces complexation, to a pressurized homogenization which induces rapid complexation and particle size reduction. Thus, it is suggested to help overcome the main drawbacks of current batch processing, i.e. large particle size, particle aggregation and prolonged duration of production. Additionally, the continuity of the process offers the technological possibility of incorporating the process in existing industrial settings of continuous manufacturing. These molecular inclusion complexes could prospectively be used in a wide variety of applications in the food, pharmaceutical and biotechnology industries including as a delivery system for the controlled and targeted delivery of nutrients, nutraceuticals and/or drugs to the lower gastrointestinal tract.
Keywords: Starch; V-amylose; Inclusion complex; Nano-encapsulation; Controlled release

Jerome Mabit, Rachida Belhamri, Francine Fayolle, Jack Legrand, Development of a time temperature integrator for quantification of thermal treatment in scraped surface heat exchangers, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 516-526, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.01.003.
(http://www.sciencedirect.com/science/article/B6W6D-4RV7YG0-1/2/abea953220e5e7f7a576360c1f888880)
Abstract:
When processing highly viscous fluids in scraped surface heat exchangers, it is often difficult to follow the real heat flux received by each part of the product. Only average temperatures are measured, and the process cannot always guarantee a correct thermal treatment. During a pasteurisation process, the average temperature is around 80 [degree sign]C, but some parts of the product may not stay long enough at this temperature compared to the average residence time.
The aim of this study is to develop a tracer in order to follow the thermal treatment of Newtonian or non Newtonian viscous fluids in an experimental scraped surface heat exchanger in conditions similar to a pasteurisation treatment. A natural coloured tracer (Betanin, from red beets) which thermal degradation is well known is used as time temperature integrator. Thermal degradation of the tracer is determined experimentally and compared with a dispersion RTD model.
First results show that Betanin degradation diluted in viscous fluids follows a classical first order reaction in a batch system. However, this degradation is enhanced when mechanical treatments occur in a well identified shearing channel as well as in the SSHE, for shear rates higher than 20 000 s- 1. The major concern was then to identify the origin of this enhancement. Temperature increase due to viscous friction was measured in the SSHE and compared with the prediction conversion factors.
It was shown that thermal treatment received by the Betanin was highly dependent on the mechanical treatment delivered during the thermal treatment.Industrial relevance
When processing highly viscous fluids in scraped surface heat exchangers, it is often difficult to follow the real heat flux received by each part of the product, especially in industrial apparatus. Only average temperatures are measured, and the process cannot always guarantee a correct thermal treatment. During a pasteurisation process, the average temperature is around 80 [degree sign]C, but some part of the product may not stay long enough at this temperature compared to the average residence time.
The aim of this study is to develop a tracer in order to follow the thermal treatment in an experimental scraped surface heat exchanger in conditions similar to a pasteurisation treatment. When this tracer is found to be appropriate, it will be used directly in industrial equipments, in order to help industrials in: first, understanding their processes; verifying that their actual operating

conditions are feasible for a correct thermal treatment; if not, in optimising these operating conditions.
Betanin, representative of sensitive food products treated in a scraped surface heat exchanger was found to be, not only sensitive to temperature but also to mechanical treatment. This rather unexpected result has to be taken into account very carefully by industrials in order to insure a content product quality, whereas the mechanical treatment undergone by the product can lead to an accentuated degradation of thermally sensitive products.
Keywords: Betanin; Highly viscous product; Mechanical treatment; Residence time distribution; Scraped surface heat exchanger; Thermal treatment

Ibtisam M. Kamal, V. Sobolik, Magdalena Kristiawan, Sabah M. Mounir, K. Allaf, Structure expansion of green coffee beans using instantaneous controlled pressure drop process, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 534-541, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.01.004.
(http://www.sciencedirect.com/science/article/B6W6D-4RV7YG0-2/2/fbe911361d9ec2002732187f96dde0bf)
Abstract:
Since 1988, when the first experiments with the Instantaneous Controlled Pressure Drop (DIC) process were performed, a lot of investigations have been carried out concerning the structure expansion, processing kinetics (drying, extraction and sterilization) and the improvement of the functional and organoleptic properties of fresh and dried foods. In this study, two DIC technologies were used to expand the structure of green coffee beans. Two varieties of commercial Arabica coffee beans of different agricultural and geographical origins (Brazilian and Ethiopian) were inspected. The effect of initial moisture content (7-40% dry basis), type of heating in the DIC process (steam and microwaves), processing parameters like pressure (0.4-0.7 MPa) and heating time (20-200 s) on bean expansion were investigated. The expansion was evaluated as the ratio of the tapped density of raw beans to that of the treated material. The hydration capacity of the beans was also studied. The Response Surface Methodology was employed to optimize the processing parameters. After the steam DIC treatment, the maximum expansion ratio of the Brazilian beans (e = 1.74) was higher than that of the Ethiopian beans (e = 1.59). For Brazilian beans, the steam DIC treatment resulted in a higher value of expansion ratio than the MW DIC treatment (e = 1.39). Concerning hydration capacity, the steam DIC treatment gave values of 78.6% and 48.2% d.b. for the Ethiopian and Brazilian beans, respectively. It means almost two-fold increase in the hydration capacity using DIC treatment. The steam DIC treatment increased and accelerated in twice the weight loss of beans during roasting.Industrial relevance
Preliminary experiments have shown that the structure expansion of green coffee beans significantly reduced the roasting time, amended the bean suitability to grinding and improved the kinetics and yield of caffeine and active compounds extraction. The industrial DIC processes can be distinguished by high quality of final products, energy saving and positive environmental impact. Due to the fragile structure of coffee beans, a batch process should be applied. Industrial plant can be designed as a tower plant with several compartments separated by guillotine valves where the material falls down by gravity force or a carrousel or a linear plant with filling, DIC treatment and discharging operations. The ABCAR DIC Process Company (La Rochelle, France) develops plants with a capacity of 50 kg/h to 8 ton/h of dry coffee beans. Despite the promising experimental results concerning microwave DIC technology, the industrial applications are so far limited to the steam DIC treatment due to technical reasons.
Keywords: Coffee beans; Coffea arabica; Structure; Instantaneous Controlled Pressure Drop; DIC

A. Cassano, L. Donato, C. Conidi, E. Drioli, Recovery of bioactive compounds in kiwifruit juice by ultrafiltration, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 556-562, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.03.004.

(http://www.sciencedirect.com/science/article/B6W6D-4S7SV4P-2/2/cb181dd206e3a1517c391fbe6ff60d1c)
Abstract:
Food quality is not only a function of nutritional values but also of the presence of bioactive compounds exerting a positive effects on human health.
This research was undertaken to study the influence of the ultrafiltration (UF) on the composition of some bioactive compounds of the kiwifruit juice in order to develop a natural product which can be used to fortify foods and beverages. At the same time the effect of transmembrane pressure (TMP) and temperature on the permeate flux was also investigated in order to identify the optimal operating conditions for the processing of the juice. An optimal TMP value occurred at 0.6-0.65 bar in different conditions of cross flow velocities. Steady-state permeate fluxes increased linearly with temperature in the range 20-30 [degree sign]C.
The kiwifruit juice was clarified in optimal operating conditions, according to the batch concentration mode, up to a final volume reduction factor (VRF) of 2.76.
The analyses of flux decay according to fouling models reported in the literature revealed that the formation of a cake layer covering the entire surface of the membrane is the main cause of the membrane fouling.
Most bioactive compounds of the depectinised kiwifruit juice were recovered in the clarified fraction of the UF process. The rejection of the UF membrane towards total phenolics was 13.5%. The recovery of glutamic, folic, ascorbic and citric acids, in the clarified juice, with respect to the initial feed, was dependent on the final VRF of the UF process: an increase of the VRF determines an increase of these compounds in the clarified juice. The rejections of the UF membrane towards these compounds were in the range 0-4.3%.Industrial relevance
Among different substances contained in the kiwifruit a primary role, in the safeguard of the human health, is carried out by some bioactive compounds such as ascorbic, folic, citric, glutamic acids and polyphenols.
This research was undertaken to study the influence of ultrafiltration on the composition of these compounds in order to develop a natural product which can be used to fortify foods and beverages.
Keywords: Kiwifruit juice; Bioactive compounds; Ultrafiltration

Xin Wu, Chengjun Sun, Liuhua Yang, Guo Zeng, Zuyang Liu, Yumin Li, [beta]-carotene content in sweet potato varieties from China and the effect of preparation on [beta]-carotene retention in the Yanshu No. 5, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 581-586, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.06.002.
(http://www.sciencedirect.com/science/article/B6W6D-4SSND6H-1/2/d9b6e51a6b6715eb22f86aabd5672bca)
Abstract:
To compare the [beta]-carotene contents in different Chinese sweet potato (SP) varieties and to choose a variety of SP rich in [beta]-carotene for the study of the effect of processing methods on [beta]-carotene retention, [beta]-carotene in thirteen varieties of sweet potato from China was measured by HPLC. The results showed that [beta]-carotene contents were significantly correlated with SP flesh colours, with the orange-red fleshed SP varieties being higher in [beta]-carotene.
[beta]-carotene contents in SP were affected by many factors, and this was demonstrated using the variety of Yanshu No.5, showing that the [beta]-carotene contents in SP grown in different farming sites in the same area ranged from 53.2 to 84.3 mg kg- 1 fresh weight. Moreover, [beta]-carotene distributes unevenly in one SP root, with highest concentrations in the core. The [beta]-carotene content was positively related to the root size.
Five processing methods including boiling, steaming, microwave cooking, frying, and post steam-drying were simulated in the study to check their effects on the true retention of [beta]-carotene in SP. Compared to boiling, steaming resulted in much more loss of [beta]-carotene and microwave

cooking resulted in the biggest loss of [beta]-carotene among the five processing methods.Industrial relevance
Orange-fleshed sweet potato can be prepared for sale and consumption, using methods that protect the [beta]-carotene content. This can aid in promoting sweet potato as a staple food as well as a snack food for supplying vitamin A for both rural and urban populations. Prepared orange-fleshed sweet potato can contribute to alleviating vitamin A deficiency in China as well as other low-income countries.
Keywords: Sweet potato varieties; [beta]-carotene; True retention; Processing methods

Pedro A. Alvarez, Hosahalli S. Ramaswamy, Ashraf A. Ismail, High pressure gelation of soy proteins: Effect of concentration, pH and additives, Journal of Food Engineering, Volume 88, Issue 3, October 2008, Pages 331-340, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.02.018.
(http://www.sciencedirect.com/science/article/B6T8J-4RXJYHC-3/2/2caa66be2765618834f3a74d52291496)
Abstract:
The global demand for soybean protein has increased dramatically over the last few years due to its versatility. High pressure (HP) processing is emerging as an effective alternative to thermal processing of foods. The HP treatment of protein solutions at different process conditions can cause partial unfolding of proteins that can lead to the irreversible gelation of the product. In this study, the influence of protein concentration (5-20% w/v), pH (3-7), sugar (5% w/v), CaCl2 (5% w/v), pressure level (up to 650 MPa) and holding time (0.1 and 10 min), and process temperature (20 and 40 [degree sign]C) on the dynamic rheology of soybean protein concentrate (SPC) solutions was evaluated. Furthermore, the protein structural changes caused by HP were studied, through the use of the extrinsic fluorescence of the probe 8-anilino-1-naphthalene sulfonic acid (ANS) and Fourier transform infrared (FTIR) spectroscopy. Results indicated a strong influence of protein concentration on both elastic (G') and viscous (G'') moduli, increasing with concentration. Increase in pressure and holding time produced an increase on both G' and G'' for SPC concentrations higher than 10%; at 15% SPC concentration, a relatively low pressure treatment of 250 MPa achieved the cross-over of G' over G''. The structure of the soybean proteins suffered limited changes after HP treatment; hydrophobicity increased, as well as the relative proportion of random coil, while the [beta]-sheet content decreased. HP treatment can be used to enhance the viscoelastic behavior of SPC after which SPC can be used to enrich both protein content and textural properties of foods.
Keywords: High pressure; Dynamic rheology; Molecular structure; Soy protein concentrate; Gelation; Viscosity

Sandro M. Goni, Emmanuel Purlis, Viviana O. Salvadori, Geometry modelling of food materials from magnetic resonance imaging, Journal of Food Engineering, Volume 88, Issue 4, October 2008, Pages 561-567, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.03.020.
(http://www.sciencedirect.com/science/article/B6T8J-4S4TNRF-1/2/aea61f37a7eb82a071284c3eb6d35878)
Abstract:
Three-dimensional geometric models of irregular food were constructed to contribute to process modelling area shedding light on geometry development aspects. Object reconstruction was performed using a cross-sectional design technique from magnetic resonance images. Boundaries of cross-section images were approximated by B-Spline curves after an image processing procedure. Then, a non-uniform rational B-Spline based model representing the food material was built using a lofting method by interpolating all B-Spline curves. This methodology was applied to lamb, pork and chicken carcasses, and beef semitendinosus muscle. The obtained geometric models were visually compared with real samples showing a very good agreement. The presented

methodology can be used to generate a geometry database saving efforts and decreasing error associated to experimental measurements.
Keywords: Irregular shape; Image processing; Finite element method; Modelling and simulation

M. Toldra, E. Davila, E. Saguer, N. Fort, P. Salvador, D. Pares, C. Carretero, Functional and quality characteristics of the red blood cell fraction from biopreserved porcine blood as influenced by high pressure processing, Meat Science, Volume 80, Issue 2, October 2008, Pages 380-388, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.12.025.
(http://www.sciencedirect.com/science/article/B6T9G-4RJYVBW-1/2/bd542bec7d94faeab95defcdf60bf414)
Abstract:
The effects of high hydrostatic pressure (HHP) processing, at 400 MPa for 15 min at 20 [degree sign]C, on the microbiological and functional characteristics of the red blood cell (RBC) fraction obtained from porcine blood, previously preserved by means of lactic acid bacteria (LAB) was studied. Biopreservation was achieved by incubation of inulin-enriched blood inoculated with a LAB strain (Enterococcus raffinosus PS99) for 72 h at 5 [degree sign]C. Results showed that incubation of blood with added E. raffinosus followed by HHP treatment reduced the levels of contaminant coliforms, proteolytic, hemolytic bacteria, and Pseudomonas spp. on RCB. Color parameters, protein solubility, foaming and emulsifying properties, as well as texture and water holding capacity of heat-induced gels from RBC were not seriously damaged by the combined treatments. This is a new approach to process and preserve animal blood fractions for the development of functional and/or nutritional food ingredients with added value.
Keywords: Porcine blood; Red blood cells fraction; Hemoglobin; Biopreservation; Lactic acid bacteria; High pressure processing; Functional properties

Yoshitsugu Ochiai, Otgonchimeg Batmunkh, Kunitoshi Ogasawara, Mariko Mochizuki, Ryo Hondo, Fukiko Ueda, Genetic variation of Listeria monocytogenes isolates from domestic and imported foods in Japan, International Journal of Food Microbiology, Volume 127, Issues 1-2, 30 September 2008, Pages 12-17, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.05.038.
(http://www.sciencedirect.com/science/article/B6T7K-4SNGM0C-3/2/8e8d906c06700241e61dc384e59749ac)
Abstract:
Phylogenetic analyses were carried out on a total of 118 Listeria monocytogenes isolates from foods or food processing environments, and 7 isolates from listeriosis patients in Japan to evaluate the genetic variation in the pathogen in this country. Isolates of serotypes 1/2a, 1/2b and 4b were mainly examined to assess the risk of exposure of humans to L. monocytogenes from foods in Japan. The nucleotide sequences of the part of the iap gene that contains the region encoding the threonine-asparagine repeat units were determined in order to construct phylogenetic trees of the isolates investigated. A phylogram showed high genetic diversity among lineage 2 isolates, while the lineage 1 isolates showed clonal characteristics. The results of the genetic analyses suggested the presence of rare putative lineage 3 isolates and epidemic clone I (ECI) isolates in foods in Japan. The results showed that ECI was also isolated from listeriosis patients. The genetic variation in L. monocytogenes in Japan reported here suggests the necessity of monitoring the pathogen in foods and environments in addition to surveillance of listeriosis patients.
Keywords: Listeria monocytogenes; iap; Phylogenetic analyses; Food

Donna-Maree Cawthorn, Sharon Botha, R. Corli Witthuhn, Evaluation of different methods for the detection and identification of Enterobacter sakazakii isolated from South African infant formula milks and the processing environment, International Journal of Food Microbiology, Volume 127, Issues 1-2, 30 September 2008, Pages 129-138, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.06.024.

(http://www.sciencedirect.com/science/article/B6T7K-4SWFNKW-2/2/82c4a5c07e0be5fbbcd9b1a21496d9c3)
Abstract:
Enterobacter sakazakii is an emerging pathogen associated with life-threatening neonatal infections resulting from the consumption of contaminated powdered infant formula milk (IFM). Recent taxonomic analyses have determined that E. sakazakii comprises a number of genomospecies, and it has been proposed that E. sakazakii be reclassified as a novel genus, 'Cronobacter'. Accurate methods are required for the rapid detection and identification of this group of micro-organisms, since even low cell numbers have been reported to cause disease. The aim of this study was to evaluate various E. sakazakii detection methods in order to ascertain the most suitable method for detection and identification of these pathogenic agents. Samples from IFM and the environment were evaluated for the presence of E. sakazakii using the isolation steps (pre-enrichment, enrichment and selection) described in the Food and Drug Administration (FDA) method for E. sakazakii detection. Sixty-four isolates (50 from IFM and 14 from the environment) were selected from tryptone soy agar (TSA), regardless of colony appearance, and these isolates were identified by 16S ribosomal DNA (rDNA) sequencing. Thereafter, different culture-dependent and culture-independent methods were evaluated to accurately detect and identify the E. sakazakii isolates. These methods included the assessment of yellow pigment production on TSA, typical colonies on chromogenic Druggan-Forsythe-Iversen (DFI) and Chromocult(R) Enterobacter sakazakii (CES) media and polymerase chain reaction (PCR) using six different species-specific primer pairs described in the literature. Identification of E. sakazakii using yellow pigment production was demonstrated to have a low sensitivity, specificity and accuracy (87%, 71% and 74%, respectively), which lowers the suitability of the FDA method. Chromogenic DFI and CES media were sensitive, specific and accurate (100%, 98% and 98%, respectively) for the detection of E. sakazakii. The specificity of the PCR amplifications ranged from 8% to 92%, emphasising the need for rigorous primer testing against closely related species. Of the primer pairs evaluated, Esakf/Esakr were the most suitable for E. sakazakii detection and identification. The detection limit of Esakf/Esakr was found to be 104 CFU/ml. This study demonstrated that no single method was capable of unambiguously confirming the presence and identity of E. sakazakii isolates, that each method had inherent advantages and disadvantages, and that in most cases several methods were required for accurate detection and identification. Further, it was demonstrated that the current FDA method for E. sakazakii detection should be revised in the light of the availability of more sensitive, specific and accurate detection methods.
Keywords: Chromogenic agar; Enterobacter sakazakii; Infant formula milk; PCR; 16S rDNA

N. Nogrady, G. Kardos, A. Bistyak, I. Turcsanyi, J. Meszaros, Zs. Galantai, A. Juhasz, P. Samu, J.E. Kaszanyitzky, J. Paszti, I. Kiss, Prevalence and characterization of Salmonella infantis isolates originating from different points of the broiler chicken-human food chain in Hungary, International Journal of Food Microbiology, Volume 127, Issues 1-2, 30 September 2008, Pages 162-167, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.07.005.
(http://www.sciencedirect.com/science/article/B6T7K-4SXYFVF-3/2/eb0b187d2326f6de07bbf6912a6ac858)
Abstract:
During the 10-month study period Salmonella contamination of broiler houses and the flocks reared in three farms (A, B and C), the slaughter houses where the flocks were slaughtered, as well as the carcass and retail raw meat products originating from them was investigated. In the broiler farm A five consecutive flocks, in the B and C farms one flock was sampled. Environmental samples were taken prior to the introductions. Environmental, drinking water, feed and faecal samples were collected regularly using standard methods. Before and during processing of the flocks, environmental and carcass samples were taken at the abattoirs. Salmonella contamination of the carcass, retail meat, as well as stool samples of farm and abattoir workers and from human

illnesses registered in the same period and region were also examined. Isolation, sero-, phage- and antibiotic resistance typing, class 1 integron and plasmid profiling of the strains were performed; their genetic relationship was assessed by PFGE. Although the broiler house and the faecal samples of the 5 flocks of the farm A were negative for Salmonella, S. infantis was isolated from 20-100% of the abattoir carcass samples. The retail raw meat samples were 0-100% S. infantis positive. The environmental samples of farm B were Salmonella negative, but the examined flock was contaminated: S. infantis was identified from 43% of the faecal samples. This serotype was identified in 100% of the carcass and retail raw meat samples. From environmental samples taken before the arrival of the 1-day-old chicks in the broiler house C, S. infantis was cultured. S. infantis prevalence in the faecal samples was 35% and all the carcass and retail raw meat samples were S. infantis contaminated. Altogether 164 S. infantis strains were isolated out of which 145 were further characterized. The vast majority (142/145) of the strains belonged to phage types 217 and 213. All but one were characterized by the nalidixic acid-streptomycin-sulphonamide-tetracycline resistances, had an 885 bp class 1 integron and a large plasmid of > 168 kb in size. The strains showed >= 88.7% genetic similarity. The results obtained shows that the same multi-drug resistant S. infantis clone was spread from the examined broiler farms contaminating the slaughter and the retail meat and appeared in the human illnesses of the examined region that was earlier detected as the dominant clone characteristic of the broiler and human population of the whole country.
Keywords: Broiler flocks; Chicken faeces; Chicken carcass; Retail raw meat; Salmonella infantis; PFGE

G. Burgos, S. de Haan, E. Salas, M. Bonierbale, Protein, iron, zinc and calcium concentrations of potatoes following traditional processing as 'chuno', Journal of Food Composition and Analysis, In Press, Corrected Proof, Available online 25 September 2008, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.09.001.
(http://www.sciencedirect.com/science/article/B6WJH-4THSX2Y-1/2/daffc5e84191694f70e9a746f2cac631)
Abstract:
Samples from unprocessed and processed cooked tubers of the nine most abundant potato cultivars used to prepare the traditional freeze-dried food product, 'chuno' in the central highlands of Peru were prepared and analyzed for their protein and mineral concentrations. The protein, iron, zinc and calcium concentration of cooked chuno of the nine cultivars evaluated ranged from 0.49 to 1.15 g, from 0.29 to 0.65 mg, from 0.04 to 0.14 mg and from 18.9 to 31.0 mg per 100 g on a fresh weight basis, respectively. Potatoes processed as chuno have a lower concentration of protein and zinc than unprocessed tubers, and a higher content of calcium, while iron concentration may be expected not to be subjected to changes. Water used in preparing the chuno is suggested to be the cause for an increased calcium concentration in the final product, as the water used had higher calcium content before (1.35 mequiv./l) than after (0.84 mequiv./l) use in the preparation. Thus, water seems to be source of the increased calcium concentration.
Keywords: Potato; Solanum varieties; Protein; Minerals; Traditional freeze-drying; Chuno; Food composition

M. Dabrio, B. Sejeroe-Olsen, S. Musser, H. Emteborg, F. Ulberth, H. Emons, Production of a certified reference material for the acrylamidecontent in toasted bread, Food Chemistry, Volume 110, Issue 2, 15 September 2008, Pages 504-511, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.02.034.
(http://www.sciencedirect.com/science/article/B6T6R-4RW43CN-2/2/a98b1daf22e073117eeca48808c6063d)
Abstract:

The need for a certified matrix reference material (CRM) of acrylamide in a food type matrix was emphasized by the competent authorities as a tool to improve comparability, ensuring accuracy and traceability of analytical results. The institute for reference materials and measurements (IRMM) responded to the international request by producing a certified reference material, ERM-BD273, containing endogenous acrylamide in a toasted bread matrix. This work describes the production of the CRM, according to [ISO Guide 34, 2000] and [ISO Guide 35, 2006] [ISO Guide 34 (2000). General requirements for the competence of reference materials producers; ISO Guide 35 (2006). Reference materials - General and statistical principles for certification], which comprises the material processing, homogeneity and stability assessment, material characterisation and the acrylamide mass fraction value assignment in toasted bread. Heterogeneity of the material between the vials processed was determined by an in-house validated gas chromatographic methodology involving acrylamide derivatisation and mass spectrometric detection and found to be below 2%. Potential degradation during storage was also investigated and a shelf-life based on this value was established. A collaborative study for material characterisation involved sixteen laboratories applying different analytical methodologies including gas chromatography or high resolution liquid chromatography and isotopic dilution mass spectrometry. The certified value for acrylamide in ERM-BD273, traceable to the international system of units (SI), is (425 +/- 29) ng g-1.
Keywords: Acrylamide; Certified reference material; Food analysis; Chromatography; Isotope dilution mass spectrometry

Ram S. Singh, Gaganpreet K. Saini, John F. Kennedy, Pullulan: Microbial sources, production and applications, Carbohydrate Polymers, Volume 73, Issue 4, 5 September 2008, Pages 515-531, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2008.01.003.
(http://www.sciencedirect.com/science/article/B6TFD-4RJYV6R-1/2/e7fd371bd439bc008bdad89337898863)
Abstract:
Pullulan is a water-soluble glucan gum produced aerobically by growing a yeast like fungus Aureobasidium pullulans. It is a regularly repeating copolymer with the chemical structure {--> 6)-[alpha]-d-glucopyranosyl-(1 --> 4)-[alpha]-d-glucopyranosyl-(1 --> 4)-[alpha]-d-glucopyranosyl-(1 -->}n. Thus the polysaccharide is viewed as a succession of [alpha]-(1 --> 6)-linked (1 --> 4)-[alpha]-d-triglucosides i.e. maltotriose (G3). Pullulan have a wide range of commercial and industrial applications in many fields like food science, health care, pharmacy and even in lithography. Due to its strictly linear structure, pullulan is also very valuable in basic research as well as a well-defined model substance. This review attempts to critically appraise the current literature on fungal exopolysaccharide (EPS) `pullulan' considering its microbial sources, structural geometry, upstream processing, downstream processing, peculiar characteristics and applications.
Keywords: Aureobasidium pullulans; Pullulan; Maltotriose; Upstream processing; Downstream processing

Katy Tapper, Emmanuel M. Pothos, Javad S. Fadardi, Eleni Ziori, Restraint, disinhibition and food-related processing bias, Appetite, Volume 51, Issue 2, September 2008, Pages 335-338, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.03.006.
(http://www.sciencedirect.com/science/article/B6WB2-4S4JYJ1-1/2/4e49f55c20fb0dfa5854da631eead969)
Abstract:
This study examined associations between restraint, disinhibition and food-related processing bias (FPB, assessed by the emotional Stroop task) in males and females in the UK, Greece and Iran. Results showed high restraint was associated with higher FPB. However, high restrained current dieters showed lower FPB that high restrained non-dieters. There was no significant difference in

FPB for those showing high versus low disinhibition. Results are discussed in relation to theories of incentive salience and current concerns.
Keywords: Food; Attentional bias; Restraint; Disinhibition; Incentive salience; Stroop; Cross-cultural; Diet; Addiction; Dietary concerns

J. Galea, M. Chechlacz, D.A. Booth, S. Higgs, N. Birbaumer, A. Nouwen, Perceptual and affective processing in appetite for foods, Appetite, Volume 51, Issue 2, September 2008, Page 366, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.04.085.
(http://www.sciencedirect.com/science/article/B6WB2-4SNHNTS-28/2/cafdbd2d7979c908e339e32a87fc5cd2)

K.G.T. Pulman, E.M. Somerville, P.G. Clifton, Effects of the GABA agonists, baclofen and muscimol, on instrumental responding for food reward, Appetite, Volume 51, Issue 2, September 2008, Page 392, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.04.191.
(http://www.sciencedirect.com/science/article/B6WB2-4SNHNTS-62/2/0d14154804b2021bf2ae51fa752f58b2)
Abstract:
Intra-accumbens administration of the GABAA agonist muscimol or the GABAB agonist baclofen strongly stimulates eating behaviour in the rat. However, previous reports have suggested that neither agonist is likely to stimulate instrumental responding for food reward. In the present study, separate groups of Lister hooded rats (N = 12, 12) were trained on a modified second-order schedule of responding, as a measure of appetitive responding for food, and then implanted with bilateral guide cannulae aimed at the nucleus accumbens shell. They were also habituated to the presentation of chow, as a measure of consummatory behaviour. They were tested on the second-order schedule following administration of vehicle, baclofen (110, 220, 660 pmol) or muscimol (220, 440, 660 pmol). Subsequently, they were given a free feeding test following an identical sequence of drug administration. Baclofen stimulated instrumental responding at an intermediate dose (220 pmol, $p < 0.01$), whereas muscimol had no significant effect on responding at any dose. Baclofen and muscimol stimulated free food intake at both intermediate and higher doses. These data demonstrate that the effects of intra-accumbens administration of baclofen and muscimol on instrumental responding are not equivalent and also show a clear dissociation between the dose-related effects of baclofen on appetitive and consummatory components of feeding behaviour. Baclofen, perhaps through heterosynaptic modulation of other neurotransmitter systems within the accumbens, has broader effects on motivational processing than muscimol.

Leopold M. Nyochembeng, Caula A. Beyl, R.P. Pacumbaba, Optimizing edible fungal growth and biodegradation of inedible crop residues using various cropping methods, Bioresource Technology, Volume 99, Issue 13, September 2008, Pages 5645-5649, ISSN 0960-8524, DOI: 10.1016/j.biortech.2007.10.061.
(http://www.sciencedirect.com/science/article/B6V24-4RDBYW4-2/2/ebf4c127841f6780a3ffbb84f21d2f8c)
Abstract:
Long-term manned space flights to Mars require the development of an advanced life support (ALS) ecosystem including efficient food crop production, processing and recycling waste products thereof. Using edible white rot fungi (EWRF) to achieve effective biomass transformation in ALS requires optimal and rapid biodegradative activity on lignocellulosic wastes. We investigated the mycelial growth of Lentinula edodes and Pleurotus ostreatus on processed residues of various crops under various cropping patterns. In single cropping, mycelial growth and fruiting in all strains were significantly repressed on sweet potato and basil. However, growth of the strains was improved when sweet potato and basil residues were paired with rice or wheat straw. Oyster mushroom (Pleurotus) strains were better than shiitake (L. edodes) strains under single, paired,

and mixed cropping patterns. Mixed cropping further eliminated the inherent inhibitory effect of sweet potato, basil, or lettuce on fungal growth. Co-cropping fungal species had a synergistic effect on rate of fungal growth, substrate colonization, and fruiting. Use of efficient cropping methods may enhance fungal growth, fruiting, biodegradation of crop residues, and efficiency of biomass recycling.
Keywords: Biodegradation; Cropping pattern; Edible white-rot fungi; Lignocellulose

Jason Link, Jay Burnett, Paul Kostovick, John Galbraith, Value-added sampling for fishery independent surveys: Don't stop after you're done counting and measuring, Fisheries Research, Volume 93, Issues 1-2, 1 September 2008, Pages 229-233, ISSN 0165-7836, DOI: 10.1016/j.fishres.2008.04.011.
(http://www.sciencedirect.com/science/article/B6T6N-4SDX2N1-3/2/36f867bd35083813ac0498396316dfcd)
Abstract:
Most fishery independent surveys count, weigh, and measure the majority of species caught. Many surveys also collect selected body structures for in-lab age determinations for selected species. We provide examples from the Northeast Fisheries Science Center's (NEFSC) bottom trawl survey that detail the development of at-sea sampling to elucidate age, growth, maturity, fecundity, spawning season, stomach contents, diet composition, condition, habitat types and prey preferences, basic oceanography (or limnology), and bioenergetics for a suite of diverse species. We show how the development of new methodologies and technologies has decreased both deck-time and time in the lab for processing many of the samples required to provide information on the topics listed above. As new technologies develop to make our trawl catch processing more efficient, we assert that we can notably increase the amount of information collected from trawl surveys with little additional effort. We show that with marginally additional catch processing time on the deck, at-sea sampling can provide a significant return on the knowledge of aquatic and marine resource species, non-resource species, habitats, food webs, and the ecosystems within which they occur. As observing systems continue to expand their remit to provide ecosystem management advice, the need for increased efficiencies on fisheries surveys will remain.
Keywords: Bottom trawl surveys; Biological sampling; Fisheries management; Fisheries science; Age; Growth; Sexual determination; Maturity; Food habits; Length-weight relationships

Baojun Xu, Sam K.C. Chang, Effect of soaking, boiling, and steaming on total phenolic contentand antioxidant activities of cool season food legumes, Food Chemistry, Volume 110, Issue 1, 1 September 2008, Pages 1-13, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.01.045.
(http://www.sciencedirect.com/science/article/B6T6R-4RRFNH3-C/2/d0ae85084199f1a474243f7b95c3e8de)
Abstract:
The effects of soaking, boiling and steaming processes on the total phenolic components and antioxidant activity in commonly consumed cool season food legumes (CSFL's), including green pea, yellow pea, chickpea and lentil were investigated. As compared to original unprocessed legumes, all processing steps caused significant ($p < 0.05$) decreases in total phenolic content (TPC), DPPH free radical scavenging activity (DPPH) in all tested CSFL's. All soaking and atmospheric boiling treatments caused significant ($p < 0.05$) decreases in oxygen radical absorbing capacity (ORAC). However, pressure boiling and pressure steaming caused significant ($p < 0.05$) increases in ORAC values. Steaming treatments resulted in a greater retention of TPC, DPPH, and ORAC values in all tested CSFL's as compared to boiling treatments. To obtain cooked legumes with similar palatability and firmness, pressure boiling shortened processing time as compared to atmospheric boiling, resulted in insignificant differences in TPC, DPPH for green and yellow pea. However, TPC and DPPH in cooked lentils differed significantly between atmospheric and pressure boiling. As compared to atmospheric processes, pressure processes

significantly increased ORAC values in both boiled and steamed CSFL's. Greater TPC, DPPH and ORAC values were detected in boiling water than that in soaking and steaming water. Boiling also caused more solid loss than steaming. Steam processing exhibited several advantages in retaining the integrity of the legume appearance and texture of the cooked product, shortening process time, and greater retention of antioxidant components and activities.
Keywords: Cool season food legumes; Soaking; Boiling; Steaming; Phenolics; Antioxidant activity; ORAC; Peas and lentils; Legumes

Mi Young Yoon, Han-Joon Hwang, Reduction of soybean oligosaccharides and properties of [alpha]-d-galactosidase from Lactobacillus curvatus R08 and Leuconostoc mesenteriodes JK55, Food Microbiology, Volume 25, Issue 6, September 2008, Pages 815-823, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.04.008.
(http://www.sciencedirect.com/science/article/B6WFP-4SD29P5-1/2/9944701a7ed938888d4c60388e581d3a)
Abstract:
This study was undertaken to investigate the potential for reducing non-digestive oligosaccharides (NDO) in soy foods, as well as the influence of exogenous conditions on intracellular [alpha]-galactosidase ([alpha]-Gal) producing lactic acid bacteria. Two strains, Lactobacillus curvatus R08 and Leuconostoc mesenteriodes JK55, showed the highest levels of raffinose degrading activity at over 40 U mL-1, and presented maximum activities during the stationary phase in a medium where raffinose was the only carbon source. Raffinose was the most effective inducer, followed by melibiose, and galactose; the enzymes were partially inhibited by fructose and sucrose. On the other hand, limited activity was observed in glucose. The strains displayed optimum activity levels at neutral pH and a 35-37 [degree sign]C temperature range. The [alpha]-Gal activities of L. curvatus R08 and Leu. mesenteriodes JK55 were maintained at pH 6.5-10.0. The activity of the [alpha]-Gal enzyme was stable in a relatively broad range of temperatures from 0 to 40 [degree sign]C for 3 h. In soymilk, Leu. mesenteriodes JK55 and L. curvatus R08 completely hydrolyzed the NDO after 18-24 h of fermentation. The abilities of L. curvatus R08 and Leu. mesenteriodes JK55 to degrade raffinose sugars and, particularly, to produce organic acids from sugar, could contribute to reductions in the anti-nutritional properties of soy, and to the accumulation of compounds with beneficial properties during food processing. Furthermore, this study provides the optimum conditions to induce [alpha]-Gal from these strains.
Keywords: [alpha]-Galactosidase ([alpha]-Gal); Non-digestible oligosaccharides (NDO); Lactic acid bacteria; Soymilk

Songming Zhu, Michele Marcotte, Hosahalli Ramaswamy, Yanwen Shao, Alain Le-Bail, Evaluation and comparison of thermal conductivity of food materials at high pressure, Food and Bioproducts Processing, Volume 86, Issue 3, September 2008, Pages 147-153, ISSN 0960-3085, DOI: 10.1016/j.fbp.2006.08.001.
(http://www.sciencedirect.com/science/article/B8JGD-4T1SFW6-1/2/defb60a1bb75eae1d76d23e03d9265de)
Abstract:
Thermal conductivity of foods at high pressure (HP) is important for understanding the thermal response of food products during HP processing. Available information is still very limited. In this study, a line heat source (LHS) probe was installed in a HP vessel to evaluate pressure-dependent thermal conductivity of food and related materials. The probe was calibrated using agar gel (2%, w/w), resulting in an excellent linear agreement between measured values and reference data of pure water. Experiments were conducted to determine thermal conductivity of several materials at pressures up to 350 MPa and initial temperatures of 5 and 25 [degree sign]C. At given temperature and pressure, thermal conductivity depended on the nature of test samples and ranked in the decreasing order: water > fresh potato > Tylose > chicken breast > salmon fillet >

cheddar cheese. Thermal conductivity was sensitive to both pressure and temperature, increasing with both. Polynomial regression model was found to give a good fit for thermal conductivity as a function of pressure both at 5 or 25 [degree sign]C. Results from this study were generally comparable to available published values thereby indicating the usefulness of the experimental approach for thermal conductivity data gathering.
Keywords: High pressure; Thermal conductivity; Food; Line heat source

Bo B.B. Jensen, Martin Lennox, Kit Granby, Jens Adler-Nissen, Robust modelling of heat-induced reactions in an industrial food production process exemplified by acrylamide generation in breakfast cereals, Food and Bioproducts Processing, Volume 86, Issue 3, September 2008, Pages 154-162, ISSN 0960-3085, DOI: 10.1016/j.fbp.2007.10.014.
(http://www.sciencedirect.com/science/article/B8JGD-4R8M8M3-1/2/1600b7e178fb478b007fa879d31a3e0e)
Abstract:
Data from an industrial case study of breakfast cereal production indicated that the generated amounts of acrylamide are greatly dependent upon the combined effects of temperature and heating time in a roasting step process. Two approaches to obtain process models for acrylamide generation were tested. The first applied a pathway-based model. The second developed a simpler more robust model based on the integrated effects of time and temperature, where the generation of acrylamide was crudely fitted to an exponentially rising function. The development of the two models highlighted a number of difficulties in applying multi-parameter models and emphasized the advantages of 'classical' approaches to process modelling, especially for use in an industrial context. The study faced with a significant degree of variability in the data, due to fluctuations in the process, which also emphasized the importance of robustness in the developed models. The correlations obtained for predicting acrylamide generation in the case study present a useful tool for food processing industry to minimize acrylamide generation. In the present case it was possible by lowering process temperature and prolonging residence time to achieve an approximately 80% reduction in acrylamide content while maintaining the desired product quality.
Keywords: Acrylamide; Modelling; Food production; Process modelling

P.E. Boon, H. Van der Voet, M.T.M. Van Raaij, J.D. Van Klaveren, Cumulative risk assessment of the exposure to organophosphorus and carbamate insecticides in the Dutch diet, Food and Chemical Toxicology, Volume 46, Issue 9, September 2008, Pages 3090-3098, ISSN 0278-6915, DOI: 10.1016/j.fct.2008.06.083.
(http://www.sciencedirect.com/science/article/B6T6P-4SX3P2K-1/2/97c163fc43fefec027b3eebeaf4a8a63)
Abstract:
We report the acute cumulative exposure to organophosphorus insecticides (OPs) and carbamates in the Dutch population and young children (1-6 years) via the diet. Residue data were derived from Dutch monitoring programmes performed during 2003-2005, and food consumption levels from the Dutch National Food Consumption Survey 1997/1998. The relative potency factor (RPF) approach was used to cumulate the exposure to OPs and carbamates using acephate and oxamyl as index compound respectively. The exposure was estimated using the probabilistic approach, including unit variability and processing effects. We demonstrate that about 3% of the composite samples analysed for OPs and 0.2% for carbamates contain combinations of these pesticides. The P99.9 of exposure to OPs and carbamates in the total Dutch population equals 23 and 0.64 [mu]g/kg BW/d respectively. For young children the corresponding exposure levels are 57 and 1.47 [mu]g/kg BW/d. When comparing the P99.9 of exposure with the ARfD, 50 and 9 [mu]g/kg BW/d for acephate and oxamyl respectively, there is only a possible health risk for young children. Spinach contributed most to the exposure to OPs in both age groups, followed by orange and mandarin. For carbamates apple (sauce) was the main product determining the exposure.

Keywords: Cumulative dietary exposure; Probabilistic modelling; Pesticides; RPF approach

Noemie Jacques, Serge Casaregola, Safety assessment of dairy microorganisms: The hemiascomycetous yeasts, International Journal of Food Microbiology, Volume 126, Issue 3, Contribution to the safety assessment of technological microflora found in fermented dairy products, 1 September 2008, Pages 321-326, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.08.020.
(http://www.sciencedirect.com/science/article/B6T7K-4PGGNY3-C/2/bd3219f23c470141cd85af5b999d5e16)
Abstract:
Hemiascomycetous yeasts constitute a class of unicellular fungi often associated with the food and drink processing industries. A number of species including Kluveromyces lactis, Debaryomyces hansenii, Yarrowia lipolytica, play a key role in the cheese-making process by providing aroma, affecting texture and/or permitting the growth of other microorgansisms. The large majority of yeast infections are due to a few opportunistic species presently classified within the genus Candida, and occur in immunocompromised patients. Recent advances in taxonomy have provided evidence for the incorrect classification of a number of yeasts and suggest that their association with the genus Candida should be reconsidered. Indeed, none of the most common pathogenic Candida species are found in cheese. Improved techniques, combined with more advanced analytical methods have brought to light several emerging pathogens, some of which are involved in cheese-making, for example D. hansenii and Y. lipolytica. Other emerging pathogens may also be found as rare occurrences in cheese. Problems in designation of these isolates are due in part to the still limited range of specific methods of identification and are exacerbated by lack of consensus concerning yeast taxonomy. These organisms cause rare infections in immunocompromised and hospitalized patients, which are generally mild and either self-limiting or easily treated. From studies with Saccharomyces cerevisiae, it seems that it is more the exposure to high doses of yeast than the identity of the species or strain that is associated with infection. As such yeasts in cheese cannot be considered to constitute a risk for healthy individuals.
Keywords: Yeast; Dairy products; Human safety; Taxonomy; Innocuity status

Byung-Kee Baik, Steven E. Ullrich, Barley for food: Characteristics, improvement, and renewed interest, Journal of Cereal Science, Volume 48, Issue 2, September 2008, Pages 233-242, ISSN 0733-5210, DOI: 10.1016/j.jcs.2008.02.002.
(http://www.sciencedirect.com/science/article/B6WHK-4RY8SMY-1/2/727dd161e72d535b564ba5239e98bf46)
Abstract:
Barley (Hordeum vulgare vulgare L.) is an ancient cereal grain, which upon domestication has evolved from largely a food grain to a feed and malting grain. However, barley food use today remains important in some cultures around the world, particularly in Asia and northern Africa, and there is renewed interest throughout the world in barley food because of its nutritional value. This review covers basic and general information on barley food use and barley grain processing for food use, as well as an in-depth look at several major aspects/traits of interest for barley food use including kernel hardness and colour, grain starch, and [beta]-glucan contents. These traits are described in terms of their effects on processing and nutrition, as well as their inheritance and the prospects for barley improvement through breeding. Whereas, the aspects listed above have been studied relatively extensively in barley in terms of content, form, genetics, physiology, and in some cases nutritional quality, little is know about functional properties for processing and food product development. Renewed interest in barley for food uses largely centres around the effects of [beta]-glucans on lowering blood cholesterol levels and glycemic index. Wholegrain barley foods also appear to be associated with increased satiety and weight loss. There is great potential to utilise

barley in a large number of cereal-based food products as a substitute partially or wholly for currently used cereal grains such as wheat (Triticum aestivum), oat (Avena sativa), rice (Oryza sativa), and maize (Zea mays).
Keywords: Barley; Hordeum vulgare; Food quality traits; Health benefits; Grain processing; Trait genetics; [beta]-glucans; Grain hardness; Grain colour

K. Dewettinck, F. Van Bockstaele, B. Kuhne, D. Van de Walle, T.M. Courtens, X. Gellynck, Nutritional value of bread: Influence of processing, food interaction and consumer perception, Journal of Cereal Science, Volume 48, Issue 2, September 2008, Pages 243-257, ISSN 0733-5210, DOI: 10.1016/j.jcs.2008.01.003.
(http://www.sciencedirect.com/science/article/B6WHK-4RVG3JR-1/2/a4506d6b17c3532d87e31aa1dcc014cb)
Abstract:
The nearly ubiquitous consumption of cereals all over the world gives cereals an important position in international nutrition. Besides the high starch content as energy source, cereals provide dietary fibre, nutritious protein and lipids rich in essential fatty acids. Important micronutrients present in cereals are vitamins, especially many B vitamins, minerals, antioxidants and phytochemicals. In general, cereals provide important amounts of most nutrients. However, processing may decrease or increase the levels of the bioactive components in grains and also modify the bioavailability of these components. In addition, interactions between bread and companion foods have effects on the nutritional quality. The aim of this paper is to review the existing literature on the effects of processing techniques and interactions with other food components in a mixed meal on the nutritional quality of bread. Furthermore, research findings on the consumer perception of bread in Belgium are included. This information can help health professionals and policy-makers to give clear and targeted advice about the positive effects of bread in the human nutrition during consultations and information campaigns.
Keywords: Bread; Nutritional value; Processing; Consumer perception

Delia B. Rodriguez-Amaya, Mieko Kimura, Helena T. Godoy, Jaime Amaya-Farfan, Updated Brazilian database on food carotenoids: Factors affecting carotenoid composition, Journal of Food Composition and Analysis, Volume 21, Issue 6, September 2008, Pages 445-463, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.04.001.
(http://www.sciencedirect.com/science/article/B6WJH-4SDPX6D-1/2/78a225bd3bd41b4ef8acbd13288cf064)
Abstract:
This article updates the Brazilian database on food carotenoids. Emphasis is on carotenoids that have been demonstrated important to human health: [alpha]-carotene, [beta]-carotene, [beta]-cryptoxanthin, lycopene, lutein and zeaxanthin. The sampling and sample preparation strategies and the analytical methodology are presented. Possible sources of analytical errors, as well as the measures taken to avoid them, are discussed. Compositional variation due to such factors as variety/cultivar, stage of maturity, part of the plant utilized, climate or season and production technique are demonstrated. The effects of post-harvest handling, preparation, processing and storage of food on the carotenoid composition are also discussed. The importance of biodiversity is manifested by the variety of carotenoid sources and the higher levels of carotenoids in native, uncultivated or semi-cultivated fruits and vegetables in comparison to commercially produced crops.
Keywords: Carotenoid; Analysis; Composition; Influencing factors; Processing effects; Health implications

Zhinan Xiang, Zhengxiang Ning, Scavenging and antioxidant properties of compound derived from chlorogenic acid in South-China honeysuckle, LWT - Food Science and Technology, Volume 41, Issue 7, September 2008, Pages 1189-1203, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.08.006.
(http://www.sciencedirect.com/science/article/B6WMV-4PJM9VV-2/2/aba6981514d574af58ffa5d93692032e)
Abstract:
Chlorogenic acid (CGA) is a natural antioxidant, and nowadays its application has been distributed in medicine, food processing and cosmetic chemical industry. However, at a certain extent its application was restricted because of its only water solubility but no liposolubility. In this research, CGA is prepared from South-China honeysuckle and modified, undergoing efficient conjugation with lauroyl chloride in the presence of triethylamine (TEA) in non-water phase, to yield the adduct that has been identified as chlorogenic laurate (CGL) from its chromatographic behavior and spectral characteristics. The scavenging and antioxidant properties of CGL were evaluated using different antioxidant tests, including 2, 2'-diphenyl-1-picrylhydrazyl radical scavenging, hydroxyl radical scavenging, superoxide anion radical scavenging, reducing power, inhibition of peroxidation of linoleic acid and ferrous ions chelating activity. In the above six assays, CGL showed antioxidant potential to varying degrees in a concentration-dependent manner, and exhibited more antioxidant potency than CGA. Especially, the EC50 value of CGL in scavenging abilities on DPPH radicals was 70.5 [mu]g/ml. The hydroxyl radicals scavenging compared with [alpha]-tocopherol was observed to high value in CGL. The antioxidant activity of CGL is not significantly different from BHT in a linoleic acid system. All the evaluations exhibited appreciable antioxidant potential for CGL. The data suggest that the modified CGA, CGL, may have a preventive effect against oxidation in liposoluble system, and would be a promising antioxidant.
Keywords: Chlorogenic acid; Chemical modification; Chlorogenic laurate; Antioxidation

Fanbin Kong, Juming Tang, Mengshi Lin, Barbara Rasco, Thermal effects on chicken and salmon muscles: Tenderness, cook loss, area shrinkage, collagen solubility and microstructure, LWT - Food Science and Technology, Volume 41, Issue 7, September 2008, Pages 1210-1222, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.07.020.
(http://www.sciencedirect.com/science/article/B6WMV-4PDSBWD-1/2/4ba9862fa8c8f4fc25f09508535c49f6)
Abstract:
The objective of this study was to gain insight into the mechanisms underlying heating-induced tenderness in muscle food products by comparing tenderness changes in chicken breast (Pectoralis major) and salmon (Oncorhynchus gorbuscha) during high-temperature treatment. Relationships among changes in chicken breast and pink salmon muscle were investigated for tenderness, cook loss, area shrinkage, collagen solubility and microstructure. Small white muscle samples (D 30 mmxH 6 mm) cut from pink salmon fillets and chicken breast were sealed in small aluminum containers (internal dimension: D 35 mmxH 6 mm) and heated in an oil bath at 121.1 [degree sign]C for different time intervals up to 2 h to simulate various thermal process durations. The changes in salmon tenderness had 4 phases (rapid toughening, rapid tenderizing, slow toughening and slow tenderizing), while that of the chicken breast only had 2 phases (rapid tenderizing and slow tenderizing). Twenty minutes was found to be a critical heating time in which >85% collagen was solubilized and shear force reached a minimum. Cook loss and area shrinkage were significantly ($P<0.05$) correlated with shear force change for both the salmon and chicken, while collagen solubility was only significant for the chicken.
Keywords: Pink salmon; Chicken breast; Thermal processing; Collagen; Tenderness

Fereidoon Shahidi, Nutraceuticals and functional foods: Whole versus processed foods, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 29 August 2008, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.08.004.

(http://www.sciencedirect.com/science/article/B6VHY-4TB184B-1/2/f9d050b618afa2e4e30c0b25e389c1b0)
Abstract:
The importance of functional foods, nutraceuticals and other natural health products has been well recognized in connection with health promotion, disease risk reduction and reduction in health care costs. Whole foods such as whole grains as well as skins and processing by-products of foods often serve as a concentrated source of components with health beneficial effects. In most cases, processing negatively affects the bioactive components of functional foods and nutraceuticals. Therefore, minimally processed products better serve the health conscious consumers.

M. Mataragas, P.N. Skandamis, E.H. Drosinos, Risk profiles of pork and poultry meat and risk ratings of various pathogen/product combinations, International Journal of Food Microbiology, Volume 126, Issues 1-2, 15 August 2008, Pages 1-12, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.05.014.
(http://www.sciencedirect.com/science/article/B6T7K-4SJP77R-2/2/1fccd2497fc700ff49f003a128c251b2)
Abstract:
Risk profiles of pork and poultry meat were carried out using an Excel-based software program, Risk Ranger. It is a semi-quantitative risk estimator answering various questions relating to the probability of exposure to a hazard, susceptibility of the population of interest, severity of the illness caused by the hazard if present and probability of food containing an infectious dose. Therefore, qualitative and quantitative inputs were used to estimate and rank the risk of various hazards/food combinations. Risk scores provided by the tool were characterized as low, medium and high. Also, health risk was estimated separately, where needed, for low and high risk populations. Low risk scores were obtained for Salmonella spp., Listeria monocytogenes and enterohaemorrhagic Escherichia coli (EHEC) for low risk population. High risk scores were obtained for hepatitis E virus (HEV) in raw pork products (both low and high risk populations). Moderate risk scores for Salmonella spp. and L. monocytogenes in processed pork or poultry-meat products (ready-to-eat or to be reheated) and partially cooked pork products were also obtained (low risk population). Scores for Staphylococcus aureus, Clostridium perfringens and Bacillus cereus and various product types were mostly in the 'medium' risk category, except for S. aureus/ready-to-eat pork products able to support growth of the organism, which fell into the high risk category. Campylobacter spp. gave moderate risk scores with one exception (raw poultry products), whereas Y. enterocolitica showed combinations of low risk and few of medium risk. High risk pathogen/product combinations identified were: 1) temperature abused, ready-to-eat pork and/or poultry-meat products with extended shelf life and cross-contaminated by L. monocytogenes (high risk population), EHEC (high risk population) or S. aureus (all population), 2) partially cooked or processed intended to be reheated pork products cross-contaminated by L. monocytogenes, served undercooked and receiving improper cooling or reheating (high risk population), and 3) all people consuming undercooked meals cross-contaminated with Campylobacter spp. (e.g. from raw poultry and raw poultry-meat products) and HEV (e.g. from raw pork and raw pork-meat products). Salmonellae gave high risk scores in all food categories (except preserved meat products) for high risk population. Preserved meats (mainly pork) such as dry fermented sausages gave low risk scores. Only Salmonella spp., L. monocytogenes and E. coli EHEC gave moderate risk ratings in case of ingredients likely to be contaminated at an early stage of processing (e.g. animal at slaughter) and inadequate fermentation process. These results may constitute a source of information for hazard assessment during application of a Food Safety Management System.
Keywords: Meat; Pathogens; Pork; Poultry; Risk assessment; Risk profile; Safety

Amit Pal, Theodore P. Labuza, Francisco Diez-Gonzalez, Shelf life evaluation for ready-to-eat sliced uncured turkey breast and cured ham under probable storage conditions based on Listeria monocytogenes and psychrotroph growth, International Journal of Food Microbiology, Volume 126, Issues 1-2, 15 August 2008, Pages 49-56, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.04.028.
(http://www.sciencedirect.com/science/article/B6T7K-4SFG4HP-2/2/6920e948b39eeffd04cda8738dfafa72)
Abstract:
The growth variability of three Listeria monocytogenes ribotypes in ready-to-eat (RTE) sliced uncured turkey breast and cured ham was studied under storage conditions that RTE foods are likely to encounter. Three product treatments studied were: (1) a control; (2) a formulation subjected to high pressure processing to reduce initial microbial load (HPP); (3) a formulation containing 2.0% potassium lactate and 0.2% sodium diacetate (PL/SD). After separate inoculation with individual L. monocytogenes ribotypes and packaging each treatment under air and vacuum, the packages were stored at 4, 8, or 12 [degree sign]C and the counts of L. monocytogenes and psychrotrophic bacteria (PPC) were determined for several weeks. The Baranyi model was used to estimate lag times and growth rates. Significant effect of strain difference was noted in both sliced products ($P < 0.05$). In the absence of antimicrobials (HPP and control), the growth rate (GR) of L. monocytogenes strains increment from 4 to 8 [degree sign]C and from 8 to 12 [degree sign]C was approximately 10 and 2 fold, respectively. The addition of PL/SD was effective in restricting the growth of L. monocytogenes and PPC at 4 [degree sign]C, but at 8 and 12 [degree sign]C significant growth was observed (more than 100-fold increase) ($P < 0.05$). In PL/SD samples, vacuum packaging slowed down the onset and the rate of growth of L. monocytogenes at 12 [degree sign]C in sliced ham and at 8 and 12 [degree sign]C in sliced turkey breast. Generally, the time to increase by 2-logs was greater in control samples than as observed in HPP-treated samples. When antimicrobials were present, the current results showed that L. monocytogenes was able to grow more than 100-fold within the typical quality-based shelf life of 60 to 90 days at 8 and 12 [degree sign]C. The findings of this study should be useful in setting the duration of a safety-based shelf life for RTE sliced meat and poultry foods.
Keywords: Listeria monocytogenes; Shelf life; Baranyi model; Sliced turkey breast; Sliced ham; Potassium lactate; Sodium diacetate

Songming Zhu, Fadia Naim, Michele Marcotte, Hosahalli Ramaswamy, Yanwen Shao, High-pressure destruction kinetics of Clostridium sporogenes spores in ground beef at elevated temperatures, International Journal of Food Microbiology, Volume 126, Issues 1-2, 15 August 2008, Pages 86-92, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.05.009.
(http://www.sciencedirect.com/science/article/B6T7K-4SHMC9V-1/2/b046c4742619765012960c0609128e02)
Abstract:
High pressure (HP) is an alternative technique for thermal sterilization of foods with minimum quality loss. HP destruction kinetics of bacterial spores is essential to establishing sterilization process, but knowledge in this field is still very limited. In this study, destruction kinetics was investigated using Clostridium sporogenes PA 3679 (ATCC7955) spores in extra-lean ground beef (5 g each sealed in a sterile plastic bag). Duplicated samples were subjected to HP treatments at 700, 800 and 900 MPa in a HP system equipped with a Polyoxymethylene insulator to maintain constant temperatures at 80, 90 and 100 [degree sign]C during pressure-holding time. The kinetic parameters of the spores (D- and Z-values) were evaluated at these pressures and temperatures. For the pressure from 700 to 900 MPa, D-values ranged from 15.8 to 7.0 and 1.5 to 0.63 min at 80 and 100 [degree sign]C, respectively. The pressure resistance of ZT(P) value was 520-563 MPa at 80-100 [degree sign]C. The temperature resistance of ZP(T) value was 19.1-19.7 [degree sign]C at 700-900 MPa, much higher than that at atmospheric condition (12.4 [degree sign]C). A

regression model was generated which can be used to predict D-value or the death time of a minimum process under given pressure and temperature conditions. HP treatment with elevated temperatures can destroy bacterial spores with a shorter time or lower temperature than conventional thermal processing. This study provides useful information for the achievement of a safe HP sterilization process.
Keywords: High pressure; Elevated temperature; Destruction kinetics; Meat products; Surrogate spores; Clostridium sporogenes

Maria G. Corradini, Mark D. Normand, Micha Peleg, Prediction of an organism's inactivation patterns from three single survival ratios determined at the end of three non-isothermal heat treatments, International Journal of Food Microbiology, Volume 126, Issues 1-2, 15 August 2008, Pages 98-111, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.05.007.
(http://www.sciencedirect.com/science/article/B6T7K-4SHF4B3-3/2/8cc22e67e68aee2d2d6dc353bed3986a)
Abstract:
Traditionally, an organism's heat resistance parameters have been determined from a set of experimental isothermal survival data. Sometimes, however, even approximating an isothermal profile, and/or obtaining counts at sufficiently short time intervals, is extremely difficult for technical and logistic reasons. The problem would be avoided if the survival parameters could be calculated from the final survival ratios determined at the end of non-isothermal heat treatments with known temperature profiles. Theoretically, if the heat resistance were characterized by three unknown survival parameters, they could be extracted by solving three simultaneous dynamic survival curves' equations. In practice, because of the three equation's complexity - they are themselves the numerical solutions of three differential rate equations - and because the experimental final survival ratios might have a scatter, realistic estimates of the survival parameters require short cut and averaging methods for their calculation. Such a method has been tried with published dynamic inactivation data on Salmonella enteritidis and Escherichia coli. The concept was validated by the ability of the Weibullian-Log logistic model, whose three survival parameters had been obtained directly from final experimental survival ratios only, to predict entire non-isothermal survival curves that had not been used in the model's formulation. The methodology need not be restricted to Weibullian and simpler survival patterns but its practicality might be lost if there are more than three survival parameters. In principle, the same procedure can be extended to biochemical processes that occur during heat preservation, especially at very high temperatures. Estimating inactivation kinetic parameters without isothermal data could also facilitate the quantification of microbial survival under realistic processing conditions and in the actual food rather than in a surrogate medium.
Keywords: Nonlinear survival kinetics; Weibull-Log logistic (WeLL) model; Thermal preservation; Predictive microbiology; Salmonella; E. coli

David C. Love, Michael J. Casteel, John S. Meschke, Mark D. Sobsey, Methods for recovery of hepatitis A virus (HAV) and other viruses from processed foods and detection of HAV by nested RT-PCR and TaqMan RT-PCR, International Journal of Food Microbiology, Volume 126, Issues 1-2, 15 August 2008, Pages 221-226, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.05.032.
(http://www.sciencedirect.com/science/article/B6T7K-4SMNXN6-4/2/0f7217e1aa9f6a7f5b90bbc6c7917ac2)
Abstract:
Enteric viruses are important agents of foodborne disease. Unfortunately, robust, quantitative methods for sampling and analysis of enteric and other viruses in processed or complex foods are not well-established. As a result, epidemiologically determined etiologies or pathogen sources in foodborne outbreaks are rarely confirmed by virological analysis. In this study, an acid-adsorption elution concentration (AEC) method previously used to monitor virus occurrence and investigate

enteric virus outbreaks in shellfish was adapted for examination of processed food items, namely tomato sauce and blended strawberries. Hepatitis A virus (HAV), poliovirus, and coliphage MS2 (MS2) were seeded in 10 or 30 g samples of tomato sauce or blended strawberries, recovered by AEC, and quantified by cell culture infectivity assay. In addition, nested reverse transcription-polymerase chain reaction (RT-PCR) and TaqMan RT-PCR assays were used to detect HAV RNA. Viruses were efficiently adsorbed to foods as an initial concentration step, with infectious HAV and MS2 adsorption of 67% and 93%, respectively, to tomato sauce, and 89% and 99%, respectively, to blended strawberries. Forty-three to 65% of HAV and poliovirus were subsequently eluted and recovered from tomato sauce using 0.5 M threonine, pH 7.2. The lower limits of HAV detection were at initial seeding levels of 14 PFU/g of tomato sauce and 33 PFU/g of blended strawberries. Unlike TaqMan RT-PCR, nested RT-PCR was not inhibited by undiluted final RNA extracts of tomato sauce or blended strawberries. The successful adaptation of the AEC method for enteric and other virus recovery, quantitation and detection in processed foods demonstrates its potential for use in the investigation of foodborne outbreaks of viral etiology and for validation of virus disinfection and sanitary processing procedures used by the food industry.
Keywords: Hepatitis A virus; Coliphage; Processed foods; Reverse transcription-PCR

Micha Peleg, Mark D. Normand, Maria G. Corradini, Interactive software for estimating the efficacy of non-isothermal heat preservation processes, International Journal of Food Microbiology, Volume 126, Issues 1-2, 15 August 2008, Pages 250-257, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.05.004.
(http://www.sciencedirect.com/science/article/B6T7K-4SGKB8V-2/2/55b61976dcd98b50f82c6b890f53d82a)
Abstract:
The most commonly used methods to generate microbial inactivation curves are based on the assumptions that microbial mortality follows first order kinetics and that the temperature effect on the `D value' or exponential rate constant is determined by the log linear model or the Arrhenius equation, respectively. However, many bacterial cells and spores follow the Weibull-Log Logistic (WeLL) model and software to simulate pasteurization and sterilization processes using this model has been available for some years as free downloadable programs written in MS Excel(R). According to this model, an organism's heat resistance parameters are Tc, a marker of the temperature level where the inactivation accelerates, k, the steepness of the Weibullian rate parameter in the lethal regime where T >> Tc and n, a measure of the semi logarithmic isothermal survival curve's concavity and its direction. Because the traditional first order kinetics is just a special case of the Weibullian model with n = 1.0, the software is applicable to both linear and non-linear inactivation. Recently, Wolfram Research Inc., the maker of Mathematica(R), has made its interactive program Mathematica Player(R) free downloadable software. A user, who need not have a copy of Mathematica(R), can view and download any of the numerous graphic demonstrations from the Wolfram Demonstrations Project web site, and continuously manipulate their dynamic parameters with sliders on the screen. One set of five such demonstrations allows the user to generate and adjust the temperature profile of heat processes, modify the targeted organism's Weibullian survival parameters and immediately observe the corresponding semi-logarithmic survival curve and the equivalent time at a reference temperature, which can also be manipulated by a slider. This free program enables food microbiologists, technologists and engineers to examine a large number of heat processing options and assess their potential safety implications. It can also serve as a training and educational tool in industry and academia.
Keywords: Survival curves; Non-isothermal inactivation; Weibullian-Log Logistic mortality; Pasteurization; Sterilization; Non-linear kinetics

Stefano Cannicci, Damien Burrows, Sara Fratini, Thomas J. Smith III, Joachim Offenberg, Farid Dahdouh-Guebas, Faunal impact on vegetation structure and ecosystem function in mangrove

forests: A review, Aquatic Botany, Volume 89, Issue 2, Mangrove Ecology - Applications in Forestry and Costal Zone Management, August 2008, Pages 186-200, ISSN 0304-3770, DOI: 10.1016/j.aquabot.2008.01.009.
(http://www.sciencedirect.com/science/article/B6T4F-4RSRDNS-1/2/5049915209768e43450f3e86542cb62c)
Abstract:
The last 20 years witnessed a real paradigm shift concerning the impact of biotic factors on ecosystem functions as well as on vegetation structure of mangrove forests. Before this small scientific revolution took place, structural aspects of mangrove forests were viewed to be the result of abiotic processes acting from the bottom-up, while, at ecosystem level, the outwelling hypothesis stated that mangroves primary production was removed via tidal action and carried to adjacent nearshore ecosystems where it fuelled detrital based food-webs. The sesarmid crabs were the first macrofaunal taxon to be considered a main actor in mangrove structuring processes, thanks to a number of studies carried out in the Indo-Pacific forests in the late 1970s and early 1980s. Following these classical papers, a number of studies on Sesarmidae feeding and burrowing ecology were carried out, which leave no doubts about the great importance of these herbivorous crabs in structuring and functioning Old world ecosystems. Although Sesarmidae are still considered very important in shaping mangrove structure and functioning, recent literature emphasizes the significance of other invertebrates. The Ocypodidae have now been shown to have the same role as Sesarmidae in terms of retention of forest products and organic matter processing in New world mangroves. In both New and Old world mangroves, crabs process large amounts of algal primary production, contribute consistently to retention of mangrove production and as ecosystem engineers, change particle size distribution and enhance soil aeration. Our understanding of the strong impact of gastropods, by means of high intake rates of mangrove products and differential consumption of propagules, has changed only recently. The role of insects must also be stressed. It is now clear that older techniques used to assess herbivory rates by insects strongly underestimate their impact, both in case of leaf eating and wood boring species and that herbivorous insects can potentially play a strong role in many aspects of mangrove ecology. Moreover, researchers only recently realized that ant-plant interactions may form an important contribution to our understanding of insect-plant dynamics in these habitats. Ants seem to be able to relieve mangroves from important herbivores such as many insects and sesarmid crabs. It thus seems likely that ants have positive effects on mangrove performance.
Keywords: Herbivorous insect; Ant; Mangrove crab; Mangrove gastropod; Leaf damage; Propagule predation

Iragavarapu Suryanarayana, Antonio Braibanti, Rupenaguntla Sambasiva Rao, Veluri Anantha Ramam, Duvvuri Sudarsan, Gollapalli Nageswara Rao, Neural networks in fisheries research, Fisheries Research, Volume 92, Issues 2-3, August 2008, Pages 115-139, ISSN 0165-7836, DOI: 10.1016/j.fishres.2008.01.012.
(http://www.sciencedirect.com/science/article/B6T6N-4RSJDNM-2/2/f7c0836c78db6a61353f258da4069c35)
Abstract:
Piscimetrics deals with software implementation of experimental design, second-generation artificial intelligence tools, viz. Neural Nets (NNs), genetic algorithms, Fuzzy Logic, Expert Systems, Wavelets and Image analysis in the field of fisheries. A brief sketch of NNs is followed by a review of their applications in forecasting, classification, distribution and fisheries management since 1978. Forecasting in fisheries covers distribution of eggs, recruitment, fish growth/age, biomass and fish catch. Other major areas are identification, abundance and food products, environmental factors and collapse of fishery industry. The data structures are given in tensorial notation. The need for the paradigm shift from classical to multi-level hybrid NNs is emphasized.

Keywords: Piscimetrics; Fisheries; Neural nets; Forecasting; Classification; Catch-effort; Artificial intelligence; Data structures

Ananias Pascoal, Jorge Barros-Velazquez, Alberto Cepeda, Jose M. Gallardo, Pilar Calo-Mata, Survey of the authenticity of prawn and shrimp species in commercial food products by PCR-RFLP analysis of a 16S rRNA/tRNAVal mitochondrial region, Food Chemistry, Volume 109, Issue 3, 1 August 2008, Pages 638-646, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.12.079.
(http://www.sciencedirect.com/science/article/B6T6R-4RKTNGK-2/2/bb5cb59f6f52661db97ccca2ce73b349)
Abstract:
A novel PCR-RFLP method was evaluated as a tool to assess the incidence of incorrect labelling of prawns and shrimps in commercial food products. The whole method can be performed in less than 8 h in only one day of work. PCR amplification with primers 16Scru4/16Scru3, targeted to the amplification of a ca. 530 bp region of 16S rRNA and tRNAVal mitochondrial genes, was coupled to restriction analysis with AluI, TaqI or HinfI. Forty-one commercial food products were considered. The molecular method considered allowed the identification of up to 17 different prawn and shrimp species in all the processed products considered. Seven (28%) of the 25 food products declaring one or more species in their labels were incorrectly labelled. Authentication was successfully assessed in commercial peeled products subjected to industrial processing, in which none of the products displayed labelling at species level. Overall, incorrect labelling was detected in 10 (24.4%) of the 41 commercial products tested, while another 16 samples (39%) exhibited incomplete labelling. The molecular method evaluated in this study proved to be a rapid and easy-to-perform two-step analytical approach to achieve species identification of commercial whole specimens of frozen prawns and shrimps and in peeled processed products where such raw materials are included as added-value ingredients.
Keywords: Food authenticity; Species identification; PCR-RFLP; mtDNA; Decapoda crustaceans; Penaeid shrimps; Prawns

Thomas Hummel, Stefan Heilmann, Olfactory event-related potentials in response to ortho- and retronasal stimulation with odors related or unrelated to foods, International Dairy Journal, Volume 18, Issue 8, 5th NIZO Dairy Conference - Prospects for Flavour Formation and Perception, August 2008, Pages 874-878, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2007.10.010.
(http://www.sciencedirect.com/science/article/B6T7C-4R33566-1/2/64a2fcca17f5a8e30690a3b9a32b0568)
Abstract:
The aim of this study was to investigate the perception of odor intensity following ortho- and retronasal odor presentation and to simultaneously study differences between ortho- and retronasal olfaction using an electrophysiological measure event-related potentials (ERP). Using air-dilution olfactometry, 24 young healthy subjects were investigated. For retro- and orthonasal stimulation, a technique was used that allowed precise control of stimulus characteristics. To investigate potential distinctions between the processing of food and non-food related odors, lavender and chocolate odors were used. Results indicated that, when an odor unrelated to food was presented in an unusual site, i.e., retronasally, the response was larger compared with presentation of the same odor at an orthonasal site. This was the other way around for a food-related odor. These changes indicate differences of information processing depending on the context and the route of odor presentation which has direct implications for the enjoyment of foods and drinks.
Keywords: Retronasal olfaction; Psychophysics; Electrophysiology

Shahrokh Khanizadeh, Rong Tsao, Djamila Rekika, Raymond Yang, Marie Therese Charles, H.P. Vasantha Rupasinghe, Polyphenol composition and total antioxidant capacity of selected apple

genotypes for processing, Journal of Food Composition and Analysis, Volume 21, Issue 5, August 2008, Pages 396-401, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.03.004.
(http://www.sciencedirect.com/science/article/B6WJH-4S7BDDP-1/2/4a5562120e1b556456905c42e4361b1b)
Abstract:
The phenolic composition, concentration and total antioxidant capacity (TAC) were determined in the flesh and peel of eight advanced cider apple breeding lines and cultivars to be used for cider production in Canada. The total phenolic content (TPC) assayed by the Folin-Ciocalteu method, the individual phenolics determined by HPLC/DAD and TAC measured using ferric reducing antioxidant power (FRAP) differed significantly among the advanced apple lines and cultivars studied. Higher concentrations of the measured parameters were found in the peel of all tested lines compared to the flesh. 'McIntosh Summerland' and 'Spartan' had the highest concentrations of polyphenols and TAC and 'SJCA16R5A15' had the lowest. There was a positive correlation between TPC and TAC in both flesh and peel (R2=0.74 and 0.51, respectively). However, a weak correlation was found between total phenolics determined by HPLC and TAC (R2=0.29 and 0.43 in flesh and peel, respectively). Results showed that procyanidins are the most predominant phenolic group in both flesh and peel, followed by hydroxycinnamic acids in the flesh and flavonols in the peel, and all are of great interest in cider making.
Keywords: Polyphenol; Phenolic; Apple; Cultivar; Apple genotype; Cider; HPLC; Antioxidant capacity; FRAP; Canada; Food composition; Food analysis

Shih-Hao Huang, Chien-Chung Chen, Chun-Mao Lin, Been-Huang Chiang, Antioxidant and flavor properties of Angelica sinensis extracts as affected by processing, Journal of Food Composition and Analysis, Volume 21, Issue 5, August 2008, Pages 402-409, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.02.005.
(http://www.sciencedirect.com/science/article/B6WJH-4S80XFR-1/2/3fb29d9c86415315c99b2abd122f8ec5)
Abstract:
Angelica sinensis (AS) was extracted with water or 20% ethanol for different time periods, and the antioxidant activity as well as flavor quality of the extracts were investigated. The AS extracts contained significant amount of phenolic acids, including nicotinic acid, phthalic acid, p-coumaric acid, and ferulic acid. Regardless the water or alcohol extraction, most of the phenolic acids reached their maximum values in 15 min. Assays including inhibition of 1,1-diphenylpicrylhydrazyl (DPPH), lipid peroxidation, and DNA relaxation activities also indicated that 15 min extraction resulted in a product with the highest antioxidant activity. The 15 min AS extracts in the concentration range of 20-200 [mu]g/ml also showed inhibitory effects on NO production in LPS-activated RAW 264.7 macrophage in a dose-dependent manner. Statistical analysis revealed that the antioxidant activity and phenolic acid concentration for all AS extracts exhibited a positive and significant linear correlation, suggesting that the phenolic acids are the important contributors for the antioxidant activity of the AS extracts. The contents of volatile compounds of AS were much higher in the 20% ethanol extracts than those in water extracts. In the 20% ethanol extracts, the amount of ligustilide, butylidene phthalide and butyl phthalide were higher in the 30-min extracts than that prepared for longer time. Considering both of antioxidant activity and flavor quality, the AS extract should be prepared with 20% ethanol with extraction time less than 30 min.
Keywords: Angelica sinensis; Dong-gui: Chinese herbal medicine; Chinese nutraceutical: antioxidant activity; Ferulic acid; Lipid peroxidation; DNA relaxation; Volatile compounds; Nitric oxide; Food composition; Food analysis

Agata Gajda, Mariola Kulawinek, Arkadiusz Kozubek, An improved colorimetric method for the determination of alkylresorcinols in cereals and whole-grain cereal products, Journal of Food

Composition and Analysis, Volume 21, Issue 5, August 2008, Pages 428-434, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.04.002.
(http://www.sciencedirect.com/science/article/B6WJH-4SDPX6D-5/2/c8353c1a8dd23cfe03220b714f472c53)
Abstract:
A rapid analytical method was developed to study the content of alkylresorcinols (ARs) in cereal grain material and the effects of processing on their amount in food. This method is based on the fact that ARs coupled with diazotized Fast Blue B Zn salt form colored derivatives in acidified methanol that can be quantified colorimetrically. The presented method is simple, sensitive (>0.1 [mu]g), fast, accessible, and inexpensive. The standard calibration curve of the assay showed acceptable linearity in the range of 0.1-7 [mu]g of homologue C15:0 (equivalent to 0.3-20 nmols) with a correlation coefficient of 0.999. The stability of the reagent used in the procedure was improved (to 4 days). The stability of the products of the reaction between the ARs and Fast Blue B Zn salt after 1 h of incubation was lengthened (to 3 h). This is an important aspect, especially when we analyze numerous cereal grain samples or carry out long-term experiments in which the use of a constant experimental environment (e.g. equipment, reagents, etc.) is crucial. The modified procedure presented here appears promising for the analysis of 1,3-dihydroxybenzene derivatives in biological samples, especially when screening numerous samples in plant breeding and food analyses.
Keywords: Alkylresorcinols; Whole-grains; Diazonium salts; Quantitative determination

Haibo Huang, Haiyan Yu, Huirong Xu, Yibin Ying, Near infrared spectroscopy for on/in-line monitoring of quality in foods and beverages: A review, Journal of Food Engineering, Volume 87, Issue 3, August 2008, Pages 303-313, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.12.022.
(http://www.sciencedirect.com/science/article/B6T8J-4RJ3W9D-6/2/fc9e3a489eeb23dcd05a649cd0515251)
Abstract:
Over the past 30 years, on/in-line near infrared (NIR) spectroscopy has proved to be one of the most efficient and advanced tools for continuous monitoring and controlling of process and product quality in food processing industry. A lot of work has been done in this area. This review focuses on the use of NIR spectroscopy for the on/in-line analysis of foods such as meat, fruit, grain, dairy products, beverage and other areas, and mainly looks at the literature published in the last 10 years. The topics covered emphasize the methods designed for on/in-line measurement of data, chemometric treatment, as well as interpretation of the experimental observations. Finally, problems relating to the successful applications of on/in-line NIR spectroscopy in production processes have been briefly outlined.
Keywords: Near infrared spectroscopy; Foods and beverages; Quality; On/in-line; Process monitoring

T. Miri, A. Tsoukalas, S. Bakalis, E.N. Pistikopoulos, B. Rustem, P.J. Fryer, Global optimization of process conditions in batch thermal sterilization of food, Journal of Food Engineering, Volume 87, Issue 4, August 2008, Pages 485-494, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.12.032.
(http://www.sciencedirect.com/science/article/B6T8J-4RM1KMG-2/2/462e2048659067e8a8fc789123d8e124)
Abstract:
Conventionally, food is significantly over-processed to ensure safety. Dynamic optimization can be used to compute optimal thermal operation condition to ensure maximum product quality while assuring food safety. Local optimization (LO) algorithms have been used to compute optimal profiles. However, LO is not guaranteed to find the best solution for non-convex functions. We show that the problem can be formulated as a convex problem with a reverse convex constraint and we implement Tuy's algorithm to optimize globally. The method is deterministic and

guaranteed to find the global optimum and therefore it is suitable to evaluate the effectiveness of local optimization to compute global optima. We compared the results of LO and global optimization (GO) to find that GO gives significantly better results for two and three heating time periods. However, for four periods the local optimizer catches up. This suggests that LO is good enough for this problem if we consider strategies with more than four periods implementable. However for many commercial processes less than four heating-cooling stages are used.
Keywords: Batch processing; Food quality; Global optimization; Modeling; Thermal inactivation; Thermal processing

Hou XuJie, Zhang Na, Xiong SuYing, Li ShuGang, Yang BaoQiu, Extraction of BaChu mushroom polysaccharides and preparation of a compound beverage, Carbohydrate Polymers, Volume 73, Issue 2, 19 July 2008, Pages 289-294, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.11.033.
(http://www.sciencedirect.com/science/article/B6TFD-4R7J860-4/2/98df97e51af04140befb63857d15b581)
Abstract:
Mushroom is attracting more and more attention for its medical foods and antitumour value. The three extraction parameters (extraction temperature, extraction time, and ratio of solvent to raw material) were determined for the highest yield of polysaccharides. To better understand how flavour of compound beverage is affected by different variable factors, a three-factor, three-level designed orthogonal experiment was developed. Factors include hawthorn juice, mushroom polysaccharides solution, and apple juice. Flavour coefficient of the compound beverage was found to depend significantly on hawthorn juice. The optimal combination parameters of the processing technology were A2B3C1, namely, mushroom juice (36.4%), hawthorn juice (45.4%), and apple juice (18.2%).
Keywords: Single-factor test; Orthogonal test; Polysaccharides; BaChu mushroom; Beverage

Umran Uygun, Berrin Senoz, Hamit Koksel, Dissipation of organophosphorus pesticides in wheat during pasta processing, Food Chemistry, Volume 109, Issue 2, 15 July 2008, Pages 355-360, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.12.048.
(http://www.sciencedirect.com/science/article/B6T6R-4RF45D6-F/2/eade5e4b91cd7fef988a5593b95bc175)
Abstract:
For investigating the carryover of some organophosphorus pesticide residues in the cereal food chain from grain to consumer, a study was set up on durum wheat, semolina and pasta. Pesticide-free durum wheat was placed into a small-scale model of a commercial storage vessel and treated with pesticides (malathion, fenitrothion, chlorpyrifos methyl, and pirimiphos methyl) according to the raw material legislation of Turkey. The residue levels of insecticides were determined in wheat, semolina, and spaghetti produced from stored wheat at various time intervals during five months of storage. A multiresidue analysis was performed using GC equipped with an NPD. The confirmation was performed by GC-MS. The residue levels of insecticides in wheat exceeded the maximum residue limits (MRLs) for wheat. The storage period was generally not effective enough to reduce the residues in wheat to levels below the MRLs. Although a considerable amount of the insecticides remained in the semolina, spaghetti processing significantly reduced residue concentrations in general. Pirimiphos methyl was the most persistent of the insecticides and comparatively less substantial loss occurred during milling and spaghetti processing due to its physicochemical properties.
Keywords: Malathion; Fenitrothion; Chlorpyrifos methyl; Pirimiphos methyl; Wheat; Semolina; Spaghetti

A. Bevilacqua, M. Sinigaglia, M.R. Corbo, Alicyclobacillus acidoterrestris: New methods for inhibiting spore germination, International Journal of Food Microbiology, Volume 125, Issue 2, 15 July 2008, Pages 103-110, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.02.030.
(http://www.sciencedirect.com/science/article/B6T7K-4S0PK39-2/2/f0039a33d8dead46b8e45168f3281903)
Abstract:
For a long period the thermal processing has been considered as the only way to reduce the initial spore number of Alicyclobacillus acidoterrestris and prevent the spoilage of acidic beverage. New methods, however, were proposed by the literature to control spore germination both in laboratory media and in real systems.
After a brief introduction on the impact of A. acidoterrestris in food microbiology and a description of enumeration methods and heat processing applied by the juices manufactures, a review of innovative approaches to inhibit and/or control spore germination is proposed. In particular, this paper focuses on two different topics; the 1st is the use of some natural compounds (monolaurin, lysozyme, nisin and essential oils) or some chemicals, conventional (like sodium-benzoate, organic acids, surfactants and chlorine dioxide) or not conventional (chlorine dioxide as gas). The 2nd topic is a description of some innovative methods to reduce the initial spore number (high hydrostatic and homogenisation pressures, radiation and microwaves).
Keywords: Alicyclobacillus acidoterrestris; Spores; Conventional methods; Natural compounds; Innovative techniques

Dennis S. Nielsen, Pia Snitkjaer, Frans van den Berg, Investigating the fermentation of cocoa by correlating Denaturing Gradient Gel Electrophoresis profiles and Near Infrared spectra, International Journal of Food Microbiology, Volume 125, Issue 2, 15 July 2008, Pages 133-140, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.03.040.
(http://www.sciencedirect.com/science/article/B6T7K-4S6P1VJ-1/2/3f831d7c39fb5cb00ad95590b8924b23)
Abstract:
Raw cocoa has an astringent, unpleasant taste and flavour, and has to be fermented, dried and roasted in order to obtain the characteristic cocoa flavour and taste. During the fermentation microbial activity outside the cocoa beans induces biochemical and physical changes inside the beans. The process is complex involving activity of several different groups of microorganisms which bring about numerous biochemical and physical changes inside the beans. Due to the complexity of these processes no thorough investigations of the interactions between the microbial activities on the outside of the beans and the chemical processes inside the beans have been carried out previously.
Recently it has been shown that Denaturing Gradient Gel Electrophoresis (DGGE) offers an efficient tool for monitoring the microbiological changes taking place during the fermentation of cocoa. Near Infrared (NIR) spectroscopy has previously been used to determine various components in cocoa beans, offering a rapid alternative compared to traditional analytical methods for obtaining knowledge about changes in the chemical composition of the cocoa beans during fermentation.
During a number of cocoa fermentations bean samples were taken with 24 h intervals to be dried and analysed by NIR. Cocoa pulp samples taken simultaneously during the same fermentations have previously been characterised using DGGE [Nielsen, D.S., Teniola, O.D., Ban-Koffi, L., Owusu, M., Andersson, T., Holzapfel, W.H. (2007). The microbiology of Ghanaian cocoa fermentations analysed using culture dependent and culture-independent methods. International Journal of Food Microbiology 114, 168-186.]. Here we report the first study where microbiological changes during the fermentation determined using DGGE are correlated to changes inside the beans determined by NIR using multivariate data analysis.

Following data pre-processing (baseline correction followed by Co-shift correction or Correlation Optimised Warping) the DGGE spectra were analysed using Principal Component Analysis (PCA). A clear grouping according to fermentation time was seen demonstrating the microbial succession taking place during the fermentation. Subsequently the DGGE spectra were correlated to the NIR spectra using Partial Least Squares regression models (PLS2). Correlations of 0.87 (bacterial derived DGGE spectra) and 0.81 (yeast derived DGGE spectra) were obtained indicating the relationship between the microbial activities in the pulp and the (bio)chemical changes inside the beans. By comparing the X-block loadings of the PLS2 models and the DGGE spectra it was possible to directly link several microbial species with changes in the NIR spectra and consequently also with changes inside the beans.
Keywords: DGGE; NIR spectroscopy; Multivariate data analysis; Cocoa

Madhumita Roy, Sudipto Mandal, Santanu Ray, Detrital ontogenic model including decomposer diversity, Ecological Modelling, Volume 215, Issues 1-3, Selected Papers from the International Conference on Ecological Modelling, 28 August -- 1 September 2006, Yamaguchi, Japan, 10 July 2008, Pages 200-206, ISSN 0304-3800, DOI: 10.1016/j.ecolmodel.2008.02.020.
(http://www.sciencedirect.com/science/article/B6VBS-4S69H9W-2/2/c13bec78b1b4f8ba5219b139fd716890)
Abstract:
Detritus influences the structure and dynamics of the living species. The quality of detritus tied by the degree of colonization such that it may be more useful in some cases to consider them as grouped entities as higher consumers in detrital branch may not distinguish between the consumption of detritus and micro-organisms that fed on it. Detritus and producer-based food models both suggest that energy supply limits the length of food chains. However, in detrital food chain the amount of dead organic matter is needed to support micro-detritivores (bacteria and fungi) is lower on average than would be required to support physiological and morphologically comparable herbivores in grazing food chain. Many questions concerning detritus and diversity are only recently beginning addressed. These include: (1) what are the factors that determine species richness in detrital communities? (2) How does diversity of detritivores affects key rates and fate of detritus processing and ultimately feed back to producer productivity and ecosystem diversity? (3) How does species diversity of organisms associated with detritus differ at different stages of its ontogeny?
In this present work a dynamic model of two pools of detritus (recalcitrant and labile pool), and decomposers (fungus and bacteria) is considered. The behavior is explored after varying the consumption of labile material by fungi, the transfer rates from one pool of detritus to another and the amount of recalcitrant material entering the system. The model is also sensitive to changes in other parameters, for example changes in assimilation and production efficiencies of microbes to reflect changes in the quality of detritus. The model behavior shows the coexistence at equilibrium between fungal and bacterial population is possible which depicted as a function of the rate of transfer from recalcitrant pool to the labile. At low rates of fungi mediated transfer of detritus, fungi are favored over bacteria. Coexistence of bacteria and fungi also depends on the amount of recalcitrant material entering the system; if inputs are dominated by labile material (that is recalcitrant input is low), fungi cannot survive. However increasing input of recalcitrant material leads to coexistence and input labile material that are high relative to other inputs can generate bacteria dominated system.
Keywords: Detritus; Recalcitrant; Labile; Fungus; Bacteria; Trophic dynamics; Detritivore; Coexistence

Anne-Sophie Darmaillacq, Clemence Lesimple, Ludovic Dickel, Embryonic visual learning in the cuttlefish, Sepia officinalis, Animal Behaviour, Volume 76, Issue 1, July 2008, Pages 131-134, ISSN 0003-3472, DOI: 10.1016/j.anbehav.2008.02.006.

(http://www.sciencedirect.com/science/article/B6W9W-4SF9MV7-2/2/e7f45a4f839b2878979e00ce3bfb01c9)
Abstract:
The ability to learn about chemosensory stimuli in the prenatal period is now well established in a wide variety of vertebrate species. This may help to shape development and behaviour. Evidence for early visual learning has already been shown in newly hatched cuttlefish. We exposed cuttlefish embryos to crabs for at least a week before hatching. This crab exposure induced a subsequent visual preference for crabs in 7-day-old juveniles. The results show for the first time embryonic visual learning in animals. Such cognitive abilities in embryos that can perceive visual stimulation could confer important adaptive advantages in processing and acquiring information about foods likely to be available after hatching.
Keywords: cuttlefish; exposure; embryonic cognition; invertebrate; prenatal learning; Sepia officinalis

Petra Tenbult, Nanne K. De Vries, Gerard van Breukelen, Ellen Dreezens, Carolien Martijn, Acceptance of genetically modified foods: The relation between technology and evaluation, Appetite, Volume 51, Issue 1, July 2008, Pages 129-136, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.01.004.
(http://www.sciencedirect.com/science/article/B6WB2-4RSJDN5-3/2/d3b3f4523185d94141ebc29232a683d9)
Abstract:
This study investigates why consumers accept different genetically modified food products to different extents. The study shows that whether food products are genetically modified or not and whether they are processed or not are the two important features that affect the acceptance of food products and their evaluation (in terms of perceived healthiness, naturalness, necessity and tastiness). The extent to which these evaluation attributes and acceptance of a product are affected by genetic modification or processing depends on whether the product is negatively affected by the other technology: Any technological change to a `natural' product (when nonprocessed products are genetically modified or when non-genetically modified products are processed) affect evaluation and acceptance stronger than a change to an technologically adapted product (when processed products are also genetically modified or vice versa).
Furthermore, evaluation attributes appear to mediate the effects of genetic modification and processing on acceptance.
Keywords: Food innovations; Genetic modification; Technology; Processing

Shaw-Yhi Hwang, Cheng-Hsiang Liu, Tse-Chi Shen, Effects of plant nutrient availability and host plant species on the performance of two Pieris butterflies (Lepidoptera: Pieridae), Biochemical Systematics and Ecology, Volume 36, Issue 7, July 2008, Pages 505-513, ISSN 0305-1978, DOI: 10.1016/j.bse.2008.03.001.
(http://www.sciencedirect.com/science/article/B6T4R-4S8TW9X-1/2/184fbb7b3237892399b7b5e777689272)
Abstract:
We assayed the interaction on the availability of plant nutrient and species of host plant on the performance of two species of Pieris butterfly. The results indicated that constant application of different levels of fertilizers to the four different host plants resulted to an increase in their content of plant nutrients. The chemical analysis showed that the added nutrients increased foliar nitrogen and water contents, but there was no effect on the level of glucosinolates. Larvae that fed on highly-nutritious foliage increased their growth rates and showed a shorter development period. The results of feeding trials revealed that the 4th-instar larvae, which had fed on host plants with higher levels of fertilization had a shorter duration of development, less consumption rate, higher growth rate and food processing efficiency. To summarize, this research revealed that both the

availability of plant nutrient and species of host plant can strongly influence the physiology and foliar chemistry of host plants. Moreover, the changes of phytochemical in the host plants may play an important role in affecting the performance (growth and food utilization efficiency) of both species of Pieris butterflies.
Keywords: Pieris rapae crucivora; Pieris canidia canidia; Host plant species; Nutrient ecology; Nitrogen; Water; Glucosinolates

H. Duygu Ozsoy, Halil Kumbur, Basudeb Saha, J. Hans van Leeuwen, Use of Rhizopus oligosporus produced from food processing wastewater as a biosorbent for Cu(II) ions removal from the aqueous solutions, Bioresource Technology, Volume 99, Issue 11, Exploring Horizons in Biotechnology: A Global Venture, July 2008, Pages 4943-4948, ISSN 0960-8524, DOI: 10.1016/j.biortech.2007.09.017.
(http://www.sciencedirect.com/science/article/B6V24-4R05J2T-9/2/f1901f314e097fdba97a6d8e3397ce51)
Abstract:
Dried biomass of Rhizopus oligosporus produced from food processing wastewater was used as an adsorbent for copper ions in water. The adsorption process was carried out in a batch process and the effects of contact time (1-48 h), initial pH (2.0-6.0), initial metal ion concentration (20-100 mg L-1) and temperature (20-38 [degree sign]C) on the adsorption were investigated. Experimental results showed that the maximum adsorption capacity was achieved at pH 5.0 and adsorbed Cu(II) ion concentration was increased with increasing initial metal concentration and contact time. The isothermal data could be described well by the Langmuir equations and monolayer capacity had a mean value of 79.37 mg g-1. A pseudo-second order reaction model provided the best description of the data with a correlation coefficient 0.99 for different initial metal concentrations. Thermodynamic parameters indicated that biosorption of Cu(II) on R. oligosporus dried biomass was exothermic and spontaneous. To observe the copper pellets on the biosorbent surface after biosorption SEM was used and copper was characterized by EDX. The results of FTIR analyses indicated that amide I and hydroxyl groups of adsorbent played important role in binding Cu(II).
Keywords: Adsorption; Cu(II); Food processing wastewater; FTIR; Rhizopus oligosporus

G. Mandalari, G. Bisignano, R.B. Lo Curto, K.W. Waldron, C.B. Faulds, Production of feruloyl esterases and xylanases by Talaromyces stipitatus and Humicola grisea var. thermoidea on industrial food processing by-products, Bioresource Technology, Volume 99, Issue 11, Exploring Horizons in Biotechnology: A Global Venture, July 2008, Pages 5130-5133, ISSN 0960-8524, DOI: 10.1016/j.biortech.2007.09.022.
(http://www.sciencedirect.com/science/article/B6V24-4PYYG2G-6/2/6e94c1c7e45d9bce622096006df66211)
Abstract:
Feruloyl esterase (FAE) and xylanase activities were detected in culture supernatants from Humicola grisea var. thermoidea and Talaromyces stipitatus grown on brewers' spent grain (BSG) and wheat bran (WB), two agro-industrial by-products. Maximum activities were detected from cultures of H. grisea grown at 150 rpm, with 16.9 U/ml and 9.1 U/ml of xylanase activity on BSG and WB, respectively. Maximum FAE activity was 0.47 U/ml and 0.33 U/ml on BSG and WB, respectively. Analysis of residual cell wall material after microbial growth shows the preferential solubilisation of arabinoxylan and cellulose, two main polysaccharides present in BSG and WB. The production of low-cost cell-wall-deconstructing enzymes on agro-industrial by-products could lead to the production of low-cost enzymes for use in the valorisation of food processing wastes.
Keywords: Xylanases; Feruloyl esterases; By-products; Cereals; Fungal utilization

M. Mohebbi, J. Barouei, M.R. Akbarzadeh-T, A.R. Rowhanimanesh, M.B. Habibi-Najafi, M. Yavarmanesh, Modeling and optimization of viscosity in enzyme-modified cheese by fuzzy logic and genetic algorithm, Computers and Electronics in Agriculture, Volume 62, Issue 2, July 2008, Pages 260-265, ISSN 0168-1699, DOI: 10.1016/j.compag.2008.01.010.
(http://www.sciencedirect.com/science/article/B6T5M-4S02T5B-1/2/c14a1910db383862676546b3b7340a21)
Abstract:
In the food industry, there is an increasing emphasis on the need for an economic and an additional cheese flavor to prepared food. In this paper a Genetic Fuzzy Rule Base System (GFRS) for modeling of viscosity in enzyme-modified cheese (EMC) is described based on experimental data. Using data obtained via measurement of viscosity in EMC prepared with different dosage of a commercial bacterial neutral proteinase, Neutrase(R) 0.5L (0.00, 0.05, 0.10, 0.15, 0.20 and 0.25 v/w%) at 30, 40 and 50 [degree sign]C with 100, 200 and 300 RPM in a viscometer, it is concluded that construction of an optimized fuzzy model for the evaluation of viscosity in EMC is a reliable procedure. This may help manufacturers to control the viscosity of EMS in processing units by selecting the appropriate combinations of potential manufacturing parameters.
Keywords: EMC (enzyme-modified cheese); Cheese; Viscosity; Modeling; Optimization; Fuzzy; Genetic algorithm

Blanca E. Garcia-Almendarez, Issac K.O. Cann, Scott E. Martin, Isabel Guerrero-Legarreta, Carlos Regalado, Effect of Lactococcus lactis UQ2 and its bacteriocin on Listeria monocytogenes biofilms, Food Control, Volume 19, Issue 7, July 2008, Pages 670-680, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.07.015.
(http://www.sciencedirect.com/science/article/B6T6S-4PB0PJH-1/2/f2d38bc9a3c6424cf4615125e0fdc816)
Abstract:
Listeria monocytogenes is a foodborne pathogen of major concern in food processing due to its wide environmental distribution and ability to form biofilms. Lactococcus lactis UQ2 is a bacteriocinogenic strain isolated from Mexican-style cheese, genetically identified as nisin A. It was grown on supplemented whey medium, representing an alternative, and probably more economical way to obtain this bacteriocin. A spray-dried crude bacteriocin fermentate (CBF) of L. lactis UQ2, or L. lactis UQ2 cells were used to test their antimicrobial activity against planktonic and sessile cells of L. monocytogenes Scott A on stainless steel chips. L. lactis UQ2 reduced >5 log cycles of this pathogen biofilms per chip, in competitive-exclusion tests at 37 [degree sign]C. A new approach was developed to evaluate the antagonic effect of L. lactis UQ2 which outnumbered Listeria cells, by using fluorescent in situ hybridization utilizing labeled specific probes. An in vitro study showed that the combination of the two main antimicrobials produced by L. lactis UQ2 (lactic acid and nisin A) can be more efficient to suppress L. monocytogenes growth than each one on its own. This study may provide information to develop strategies to suppress or control L. monocytogenes biofilms on stainless steel surfaces, one of the most common materials used for food processing equipment.
Keywords: Nisin; Competitive-exclusion; Listeria monocytogenes; Biofilms

P. Pittia, R. Furlanetto, M. Maifreni, F. Tassan Mangina, M. Dalla Rosa, Safe cooking optimisation by F-value computation in a semi-automatic oven, Food Control, Volume 19, Issue 7, July 2008, Pages 688-697, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.07.008.
(http://www.sciencedirect.com/science/article/B6T6S-4P7FSB9-2/2/79781f0ab47147a3123a74d71a30111f)
Abstract:

Cooking represents an important step in food processing for both sensorial and safety aspects. Aim of this study was to optimise the cooking cycles of a semi-automatic oven by definition and settling of minimum thermal conditions to guarantee safety while keeping sensorial quality of cooked foods. To this purpose, the heat penetration curves and the correspondent thermal lethality effect (FT) of cooking cycles conventionally adopted to prepare some foods and dishes characterised by different microbial risk (high: lasagne pie, meat minced roll, meat filled peppers; standard: spinach and salmon), were determined. On the basis of the microbial quality and the desired safety level, minimum thermal conditions (F71.1 = 5 min and T = 75 [degree sign]C at the slowest heating point of the food) were defined and settled in the electronics of the oven. These conditions were found to determine a sufficient number of log reduction of both total microbial count and coliforms able to guarantee safety as well as sensory quality at consumption. The oven with modified electronics during the heating step of cooking cycles records in real time the temperature in the product by a multipoint thermocouple, detects the slowest heat penetration curve and computes, by an internal computer the correspondent F71.1. After initial setting of the food category, this semi-automatic oven is able to find automatically the proper process conditions during cooking to obtain the correspondent FT, to let the cooking stop at the end of the recipe or to conduct the thermal treatment till the reaching of the set FT according to the risk category chosen before cooking start.
Keywords: F71.1; Safety; Semi-automatic oven; Cooking; Food quality

Christopher Mutungi, Peter Lamuka, Samuel Arimi, James Gathumbi, Calvin Onyango, The fate of aflatoxins during processing of maize into muthokoi - A traditional Kenyan food, Food Control, Volume 19, Issue 7, July 2008, Pages 714-721, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.07.011.
(http://www.sciencedirect.com/science/article/B6T6S-4P961YC-1/2/880cfdadd420987d9ed810da15bcb381)
Abstract:
The effect of processing muthokoi, (a traditional dehulled maize dish in Kenya) on aflatoxin content of naturally contaminated maize was investigated. Dehulling decreased aflatoxin levels by 46.6% (5.5-70%) in maize samples containing 10.7-270 ng/g aflatoxin levels. Soaking muthokoi in 0.2%, 0.5% and 1.0% solutions iati, sodium hypochlorite or ammonium persulphate for 6 or 14 h further decreased aflatoxin contents by 28-72% in maize samples containing 107-363 ng/g aflatoxin levels, and boiling muthokoi at 98 [degree sign]C for 150 min in 0.2-1.0% w/v iati decreased aflatoxin contents by 80-93% in samples having 101 ng/g aflatoxin contamination. Findings imply that exposure to acute aflatoxin levels in maize is minimised during processing and preparation of muthokoi.
Keywords: Maize; Muthokoi; Aflatoxin

Z. Yang, X. Fan, S. Bakalis, D.J. Parker, P.J. Fryer, Impact of solids fraction and fluid viscosity on solids flow in rotating cans, Food Research International, Volume 41, Issue 6, July 2008, Pages 658-666, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.04.008.
(http://www.sciencedirect.com/science/article/B6T6V-4SDGR1T-1/2/71cda93416318c87471c268d13afe9fa)
Abstract:
Solids motion in a fluid significantly contributes to particulate heat transfer with that fluid, particularly in the radial direction for axially rotating cans. In this paper, the flow pattern, velocity profile and residence time distribution of solids and the solids' position exchange frequency between the centre and the wall of cans have been investigated using the positron emission particle tracking (PEPT) technique. The results indicate that the solids flow is complex and varies significantly with the solids fraction and the liquid viscosity, but follows specific patterns. The solid trajectories took a 'D' shape in water and golden syrup while a reflected 'D' shape in dilute golden

syrup. A good exchange of solids from wall to the central region was observed with the dilute golden syrup which had a viscosity of 2 Pa s. The optimum solids flow pattern for a fast and uniform heating of canned foodstuffs can be achieved by controlling the liquid viscosity, solids fraction and the solids/liquid density difference under monitoring using PEPT.
Keywords: Heat transfer; Solids motion; Velocity profiles; Food processing; Positron emission particle tracking

Z.K. Brown, P.J. Fryer, I.T. Norton, S. Bakalis, R.H. Bridson, Drying of foods using supercritical carbon dioxide -- Investigations with carrot, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 280-289, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.07.003.
(http://www.sciencedirect.com/science/article/B6W6D-4PCGS06-1/2/1709d1208dbd77ce9108a455f65adb6e)
Abstract:
The use of supercritical carbon dioxide (scCO2) for the removal of moisture from cylindrical pieces of carrot has been investigated. The experiments were carried out at 20 MPa pressure and the effects of temperature and co-solvent (ethanol) addition were examined. At the investigated conditions, comparisons with air-drying indicated that drying kinetics and the associated drying mechanisms differed between the techniques. The microstructural characteristics of carrot pieces that had been dried using the different techniques were compared using X-ray microtomography and light microscopy. Carrots dried in the supercritical fluid environment were seen to retain their shape much better than air-dried carrots which underwent shrinkage. Samples dried in ethanol-modified scCO2 possessed less dense structures and consequently displayed more favourable rehydrated textural properties than the air-dried equivalents.Industrial relevance
Drying is a common unit operation in food processing, but the rehydrated product is often of very poor quality. Comparatively little work has been done on optimising drying for quality of the final, rehydrated product. Supercritical drying is a possible way of maintaining product microstructure, and this paper describes experiments in which the supercritical drying of carrot is studied and compared with conventional processes.
Keywords: Carrot; Air-drying; Supercritical carbon dioxide; Drying kinetics; Microstructure

Philipp Heindl, Avelina Fernandez Garcia, Peter Butz, Bernhard Trierweiler, Heiner Voigt, Eberhard Pfaff, Bernhard Tauscher, High pressure/temperature treatments to inactivate highly infectious prion subpopulations, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 290-297, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.07.013.
(http://www.sciencedirect.com/science/article/B6W6D-4R98K7B-1/2/8e7a7b33c04c979d0b076e20eeb7581c)
Abstract:
High hydrostatic pressure can be used for gentle pasteurization of food as well as a physical parameter to study the stability and energetics of biomolecules. High pressure has been recently postulated as a feasible technology to decontaminate scrapie infectious materials. Here we discuss the kinetic parameters driving the inactivation of the Transmissible Spongiform Encephalopathy agents and the perspectives of pressure as a thermodynamic parameter to obtain a deeper insight into the aggregation of the 263K strain of scrapie. At 60-80 [degree sign]C an efficient pressure inactivation of infectious scrapie prions was observed during short pressure treatments at 800 MPa (3 x 5 min cycles). However, discrepancies between in vivo infectivity counts and the results of an enzyme immunoassay further revealed that the infectivity was inactivated faster and much more efficiently than PrPres was degraded, indicating that pressure affects a highly infectious subpopulation of scrapie prions.Industrial relevance
Conventional inactivation methods for the agents of the Transmissible Spongiform Encephalopathies are not compatible with food processing due to the required aggressive conditions. High pressure assisted thermal sterilization methods are nowadays attracting attention

as a food preservation technology able to preserve quality attributes. Here the stark effects in the secondary prion structure of high pressure combined with heat below the usual denaturing conditions were investigated with specific tests. This technology was proven to be a feasible alternative to achieve the decontamination of TSE risk materials at milder conditions. Kinetic data provided here should be useful to establish criteria to inactivate prions under pressure.
Keywords: High pressure; 263K strain; Scrapie prions; Inactivation kinetics; Enzyme immunoassay; EIA; Prion infectivity; Prion inactivation

Zhendong Yang, Yonbin Han, Zhenxin Gu, Gongjian Fan, Zhigang Chen, Thermal degradation kinetics of aqueous anthocyanins and visual color of purple corn (Zea mays L.) cob, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 341-347, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.09.001.
(http://www.sciencedirect.com/science/article/B6W6D-4R40SN5-1/2/d4070c93fc972cfc38647f7f4636b0cf)
Abstract:
Purple corn cob was the byproduct during the corn processing. Thermal degradation kinetics and Hunter color parameters (a*, b*, C*, h[degree sign] and [Delta]E) of aqueous anthocyanins from purple corn cob were studied at selected temperatures (70 [degree sign]C, 80 [degree sign]C and 90 [degree sign]C) at pH 4.0. The results indicated that the thermal degradation of anthocyanin and Hunter color C*, a* and [Delta]E parameters followed the first-order reaction kinetics, while Hunter color h[degree sign] and b* parameters followed zero-order reaction kinetics. The calculated values of activation energies (Ea) were 18.3, 35.9, 37.1, 31.6, 34.9 and 30.0 kJ/mol for anthocyanins, C*, a*, [Delta]E, h[degree sign] and b* parameters, respectively. The higher Ea indicated that greater temperature sensitivity of visual color as compared to anthocyanins content. The degradation of anthocyanins showed positive correlation with C* (R2 > 0.909), a* (R2 > 0.860) and [Delta]E (R2 > 0.940), while the degradation of anthocyanins showed negative correlation with h[degree sign] (R2 > 0.828) and b* (R2 > 0.735) during heating.Industrial relevance
Purple corn cob was the byproduct during the corn processing. Purple corn cob is dark purple to almost black color due to its high content of anthocyanins, which makes this byproduct a good source of anthocyanins. In this study, the excellent linear correlation between Hunter color parameters (a*, b*, C*, h[degree sign] and [Delta]E) and content of anthocyanins showed that the Hunter color parameters may also be used instead of anthocyanins content during heating. The advantage of using the visual Hunter color parameters may be measured as on-line quality control parameters during thermal processing of food industry.
Keywords: Purple corn cob; Anthocyanins; Hunter color parameters; Kinetics

Reena Randhir, Young-In Kwon, Kalidas Shetty, Effect of thermal processing on phenolics, antioxidant activity and health-relevant functionality of select grain sprouts and seedlings, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 355-364, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.10.004.
(http://www.sciencedirect.com/science/article/B6W6D-4R41J2V-1/2/455e7537875dff75dd1f5686286208b3)
Abstract:
The effect of thermal processing via autoclaving on modifications of total phenolics, antioxidant activity and functionality of wheat, buckwheat, corn and oats sprouts and seedlings were investigated. Functionality for type 2 diabetes related [alpha]-amylase, [alpha]-glucosidase inhibition and levo-dihydroxy phenylalanine (l-DOPA) content, hypertension related angiotensin converting enzyme 1 (ACE) inhibition and ulcer related Helicobacter pylori inhibition were evaluated using in vitro assays. Thermal processing in general resulted in tissue browning leading to higher total phenolic content and free radical scavenging-linked antioxidant activity. It increased [alpha]-amylase inhibitory activity in buckwheat and oats but decreased in wheat and corn sprouts

and seedlings. It increased [alpha]-glucosidase inhibitory activity in wheat, buckwheat and oats but decreased in corn sprouts. It reduced the cognitive function/diabetes related l-DOPA content in all grains sprouts and seedlings tested. It increased ACE inhibitory activity in buckwheat and oats, but decreased in wheat and corn sprouts. It also improved the ulcer related H. pylori inhibitory activity in all grain sprouts and seedlings studied. These changes in functionality are suggested to be due to modifications in the total phenolic content and profile by phenolic oxidation or polymerization caused by thermal processing. Therefore, diet designs for chronic disease management will have to consider thermal processing-linked modification of bioactive ingredient profiles.Industrial relevance
Thermal processing altered the total phenolic content and antioxidant activity in winter wheat, buckwheat, corn and oats sprouts and seedlings. It modified the [alpha]-amylase inhibitory activity, [alpha]-glucosidase inhibitory activity, l-DOPA content, ACE inhibitory activity and H. pylori inhibitory activity of samples. Therefore, the food processing industry and diet design for chronic disease management will have to consider thermal processing-linked modification of bioactive ingredient profiles for more effective health benefits.
Keywords: Thermal processing; functionality; Wheat (Triticum aestivum); Buckwheat (Fagopyrum esculentum); Oats (Avena sativa); Corn (Zea mays); Type 2 diabetes; Hypertension; Ulcer, Phenolics; Antioxidant activity; Levo-dihydroxy phenylalanine (l-DOPA); [alpha]-amylase inhibition; [alpha]-glucosidase inhibition; Angiotensin converting enzyme 1 (ACE) inhibition; Helicobacter pylori inhibition

K. Mehauden, S. Bakalis, P.W. Cox, P.J. Fryer, M.J.H. Simmons, Use of Time Temperature Integrators for determining process uniformity in agitated vessels, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 385-395, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.10.006.
(http://www.sciencedirect.com/science/article/B6W6D-4R644NS-1/2/dc649e145c2bf0121bc512a59a0e740a)
Abstract:
Time Temperature Integrators (TTIs) were used to investigate the process uniformity of an industrial scale 250 l agitated vessel. Factors such as fluid viscosity, fill level and direct and indirect heating have been examined. Different numbers of TTIs were added throughout each experiment and temperature was recorded using 2 thermocouples: one fixed in the centre and one on the wall of the vessel. TTIs were added at the start of the experiment and also at the end of the heat up time. Novel designs of TTI fitted inside either porous plastic balls or a series of plastic tie clips to prevent over-processing due to contact with the hot vessel wall were also used. P values recorded by the TTIs illustrated significant heterogeneity of heating for viscous fluids which could be partly overcome by steam injection. Overfilling also affected the heating efficiency, possibly due to changes in the flow field. The use of the novel TTIs enabled more accurate determination of the thermal processing of the fluid away from the vessel wall. This paper demonstrates that TTIs can be used for thermal monitoring and validation of processes in the food industry (centre and wall) which is more representative.Industrial relevance
Time Temperature Integrators (TTIs) are potentially very valuable tools for the measurement and validation of thermal processes. This paper gives an example application of such a safety/quality tool which could be used to improve design by demonstrating process uniformity under real conditions.
Keywords: Time Temperature Integrators; Large agitated vessel; Thermal processing; Thermocouple

P.F. Fox, A. Brodkorb, The casein micelle: Historical aspects, current concepts and significance, International Dairy Journal, Volume 18, Issue 7, MILESTONE ACHIEVEMENTS IN DAIRY SCIENCE RESEARCH AND THEIR CURRENT AND FUTURE INDUSTRIAL APPLICATIONS -

Proceedings of a Symposium marking the retirement of Professor Paul Jelen from active service at University of Alberta, Canada, July 2008, Pages 677-684, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2008.03.002.
(http://www.sciencedirect.com/science/article/B6T7C-4S0PK5X-2/2/c34e2bfdc0a5584255964e78b9eadf64)
Abstract:
The caseins, a group of unique milk-specific acid-insoluble phosphoproteins, represent [approximate]80% of the total protein in the milk of cattle and other commercial dairy species. Owing to their commercial importance, the caseins have been studied very extensively and are probably the best characterized food protein system. It has been recognized since the work of Schubler in 1818 that the caseins exist in milk as large particles suspended in the aqueous phase (milk serum). Initially, the casein particles were usually referred to as 'calcium caseinate-calcium phosphate particles'. The term 'casein micelle' was introduced in 1921 and the two terms were used interchangeably for several years but since about 1960, the latter term has been used exclusively. It has been suggested that the calcium caseinate-phosphate particles are not true micelles. The term 'micelle' was introduced by Nageli and Schwendener [Nageli, C.W., & Schwendener, W. (1877). Das Mikroskop: Theorie und Anwendung Desselben (2nd ed.). Leipzig: W. Engelmann] for microparticles of cellulose in plant cells visible in the light microscope; later, it was used for various other types of aggregates. Owing to the importance of the casein micelles for many of the physico-chemical properties of milk and dairy products, their structure and properties and the effects of compositional and processing factors thereon have been studied extensively. Since the discovery of the micelle-stabilizing protein, [kappa]-casein, in 1956, several models of the casein micelle have been proposed and refined. This review will focus on the following aspects: introduction and use of the term 'micelle', early views on the stability of casein in milk, introduction of the term 'casein micelle' for the calcium phosphate-calcium caseinate particles in milk, and the structure and stability of casein micelles.

F.W. Bodyfelt, M.A. Drake, S.A. Rankin, Developments in dairy foods sensory science and education: From student contests to impact on product quality, International Dairy Journal, Volume 18, Issue 7, MILESTONE ACHIEVEMENTS IN DAIRY SCIENCE RESEARCH AND THEIR CURRENT AND FUTURE INDUSTRIAL APPLICATIONS - Proceedings of a Symposium marking the retirement of Professor Paul Jelen from active service at University of Alberta, Canada, July 2008, Pages 729-734, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2008.03.011.
(http://www.sciencedirect.com/science/article/B6T7C-4S21TJX-3/2/7739a31f5cc022d04121e7538fedcbaf)
Abstract:
Food scientists use three methods for tracing the causes and nature of various sensory quality problems in dairy foods: (1) chemical procedures, (2) microbiological analyses, and (3) sensory evaluation techniques. Food technologists or scientists who have received training and experience in flavor evaluation of dairy foods are deemed to have an advantage over a counterpart who may be competent only in performing chemical and/or microbiological methods. The correct identification and precise diagnosis of types and cause(s) of serious sensory shortcomings is prerequisite for the application of appropriate remedial measures or corrective steps for successful production, processing, and distribution phases of dairy foods manufacturing and marketing. Since about 1900, dairy-foods-related educational programs at North American and European universities and dairy technical trade schools have included instruction, formalized courses, training aids, and eventually competitive opportunities for students to develop and apply their skills in conducting sensory assessments. These ongoing educational programs have been credited with helping assure higher and more consistent flavor quality for most categories of dairy foods. Preparation for and participation in an annual Collegiate Dairy Products Evaluation Contest has

served to test, recognize, and reward students for their dairy products sensory evaluation (judging) skills.

N.Y. Njintang, M.L. Parker, G.K. Moates, C.B. Faulds, A.C. Smith, K.W. Waldron, C.M.F. Mbofung, J. Scher, Microstructure and creep-recovery characteristics of achu (a taro based paste) made from freeze dried taro chips as affected by moisture content and variety, Journal of Food Engineering, Volume 87, Issue 2, July 2008, Pages 172-180, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.11.033.
(http://www.sciencedirect.com/science/article/B6T8J-4R8WJM6-1/2/5f5ccd7bf710a3dc1372ec811bf46031)
Abstract:
Achu is a mashed taro paste traditionally obtained by cooking fresh corms until softening, followed by peeling and pounding in a mortar to obtain a smooth and homogeneous paste. In the present study, the utilisation of precooked freeze dried taro chips as convenience food for the preparation of achu was investigated. The Peleg rehydration kinetic model was used to define the conditions for reconstitution. Changes in parenchymous tissue structure and transformation of starch during production of achu from cooked corms and instant chips were followed by light and scanning electron microscopy, stereomicroscopy, and rheology. Four varieties of taro corms and cormels coded WC, RI, MBA and MF were used in this study. The corms were cooked whole, cut into cubes and freeze dried. Unprocessed, processed corms and achu were characterised. As results, the water absorption kinetic of instant chips followed the Peleg model. Reconstituted achu was not significantly different to that made traditionally. The achu paste made from traditional and freeze dried chips consists of starch-filled cells encased in a continuous amylose-amylopectin gel containing some vascular elements and mucilage. This study confirmed that cooking of whole corms/cormels before drying constituted a good approach in the processing of taro flour, usable in the preparation of achu.
Keywords: Taro chips; Achu; Starch; Microstructure; Texture

M. Carsky, Design of a dryer for citrus peels, Journal of Food Engineering, Volume 87, Issue 1, CHISA 2006 Special Section (pp. 1-63) - Selected papers from the symposium 'Food Processing and Technology' held at the 2006 CHISA Congress, Prague, Czech Republic, 2006 CHISA Congress, July 2008, Pages 40-44, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.09.003.
(http://www.sciencedirect.com/science/article/B6T8J-4PMJJWY-5/2/7f3c6ac781ba3ffe6e6db51b92ce5d05)
Abstract:
Citrus peels are important source of production of food additives. South Africa is the third largest citrus exporter in the world but presently no citrus peels are used for further processing. On contrary the country is forced to import these chemicals from overseas in spite of a good quality raw material source in the form of citrus waste. Because citrus fruits are seasonal it is therefore necessary to preserve these peels for use in the off-season. The objective of the study was to investigate the drying dynamics of lemon peels and to show a design strategy of an industrial scale dryer based on laboratory and pilot plant tests. Laboratory drying tests with peels crushed into three different sizes (3, 6, and 9 mm) provided drying times (15, 20, and 40 min at 150 [degree sign]C, and 30, 35, and 60 min at 100 [degree sign]C) to achieve the required final moisture content of peels (10%). Because of particle agglomeration and relatively long drying times a fluidised bed dryer has been chosen. After successful pilot plant tests a preliminary design of a fluidised bed dryer of the required capacity has been done.
Keywords: Drying; Fluidised bed dryer; Food chemicals

O.J. Oyelade, T.Y. Tunde-Akintunde, J.C. Igbeka, Predictive equilibrium moisture content equations for yam (Dioscorea rotundata, Poir) flour and hysteresis phenomena under practical

storage conditions, Journal of Food Engineering, Volume 87, Issue 2, July 2008, Pages 229-235, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.11.036.
(http://www.sciencedirect.com/science/article/B6T8J-4R9GGM5-2/2/c28ad890015a1b5a78380aad980ccdda)
Abstract:
Fitting equilibrium moisture content data of food products into empirical equations is a first vital step in identifying acceptable mathematical expressions that could be subsequently applied in several food processing related operations. Adsorption and desorption (sorption) moisture isotherms were constructed for yam flour at the temperature of 27, 32, 37 and 40 [degree sign]C, in the water activity (aw) range of 0.10-0.80. Effects of temperature were significant on the isotherms which appeared sigmoidal. Five widely recommended three parameters sorption models were fitted to the generated data from the gravimetric method. Desorption isotherms appears well fitted than adsorption isotherms. Over all, the modified Oswin (MOE) model describes the sorption characteristics of yam flour better than other models. Constructed moisture sorption plots showed a tendency of executing a closed loop (hysteresis loop) of which size appears to decrease as temperature increases.
Keywords: Yam flour; Equilibrium moisture content; Sorption isotherms; Predictive equations; Hysteresis

Greta Kresic, Vesna Lelas, Anet Rezek Jambrak, Zoran Herceg, Suzana Rimac Brncic, Influence of novel food processing technologies on the rheological and thermophysical properties of whey proteins, Journal of Food Engineering, Volume 87, Issue 1, CHISA 2006 Special Section (pp. 1-63) - Selected papers from the symposium 'Food Processing and Technology' held at the 2006 CHISA Congress, Prague, Czech Republic, 2006 CHISA Congress, July 2008, Pages 64-73, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.10.024.
(http://www.sciencedirect.com/science/article/B6T8J-4R1MDVK-2/2/762203dee221cfb1b0d96f25f6b8a7ec)
Abstract:
The effects of three emerging technologies: high pressure (HP: 500 MPa, 10 min), ultrasound (US: 20 kHz, 15 min) and tribomechanical activation (TA: 40000 rpm) on flowing behaviour and thermophysical properties of whey protein isolate (WPI) and whey protein concentrate (WPC) were investigated. HP and US were carried out on 10% (w/w) model dispersions while for TA samples were in powdered form. Pressurization caused significant decrease ($p < 0.05$) in solubility of WPC and WPI, while both samples treated with US and TA exhibited significantly better solubility ($p < 0.05$) compared to control. Apparent viscosity data described with power law equation ($r2 = 0.97$-0.99) significantly increased ($p < 0.05$) after all treatments while HP caused the most intensive changes in rheological behaviour. The flow behaviour of WPC and WPI was observed to be shear-thickenning after all treatments. Decrease of initial freezing point, accompanied with increase of specific enthalphy were remarkable for all samples. It could be concluded that high pressure considerably affected the examined properties compared to other two treatments.
Keywords: High pressure; Ultrasound; Tribomechanical activation; Whey protein concentrate; Whey protein isolate; Rheology; Initial freezing point

Jessica Capraro, Chiara Magni, Massimo Fontanesi, Andrea Budelli, Marcello Duranti, Application of two-dimensional electrophoresis to industrial process analysis of proteins in lupin-based pasta, LWT - Food Science and Technology, Volume 41, Issue 6, July 2008, Pages 1011-1017, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.07.011.
(http://www.sciencedirect.com/science/article/B6WMV-4P8SJG1-5/2/e456c27561c3353fb2e559400e6f06e0)
Abstract:

Two-dimensional (2-D) IEF/SDS-PAGE is a powerful tool to get molecular 'pictures' of food proteomes and monitor the processing effect(s) of a given food item on its protein profile. Still the use of 2-D approaches to this aim is rather uncommon.
In this work, 2-D electrophoresis has been used to monitor the main steps of lupin-based gluten-free pasta production. Three different production lots, spanning over 1 year of pasta production, were analysed. Various samples at each critical production step, including seeds, raw materials, half-processed products and dry pasta, were used to generate the corresponding 2-D electrophoretic maps.
Some differences in the protein profiles between the raw materials, i.e. lupin flour and lupin protein concentrate, were attributed to the different varieties which they arose from. On the other hand, the electrophoretic analyses showed only minor differences among the samples during the industrial processing. In particular, there was no alteration of the covalent continuity of the main polypeptide backbones. The disulphide pattern did not change during the process, either, and the constancy of the glycosylation pattern, as measured by the lectin Concanavalin A on the blotted maps, indicated that this molecular feature was not affected by the process too.
The work shows how helpful the use of 2-D electrophoresis to trace proteins and evaluate the effects of the production processes in protein food manufacturing can be.
Keywords: 2D-IEF/SDS-PAGE; Lupin proteins; Gluten-free products; Celiac disease

M.A. Ayadi, T. Benezech, F. Chopard, M. Berthou, Thermal performance of a flat ohmic cell under non-fouling and whey protein fouling conditions, LWT - Food Science and Technology, Volume 41, Issue 6, July 2008, Pages 1073-1081, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.06.022.
(http://www.sciencedirect.com/science/article/B6WMV-4P59XJM-2/2/ff0636ffb71ff296c5688e28dd6e5669)
Abstract:
Temperature gradients, between electrode surfaces and bulk, in a continuous flat ohmic cell under whey protein fouling were studied. The temperature profiles in non-fouled cell were studied using two Newtonian fluids (water and an aqueous solution of sucrose at 55 g/100 g) and a pseudoplastic fluid (an aqueous solution of xanthan gum at 0.2 g/100 g). The temperature gradients were studied using two fouling fluids: an aqueous solution of [beta]-lactoglobulin and an aqueous solution of [beta]-lactoglobulin-xanthan gum mixture. Obtained result shows the existence of a temperature difference between electrode surfaces and the bulk when heating non-fouling fluids. The value and the shape of these gradients depend on the Reynolds number and the rheological behavior of the fluid. Under fouling conditions, the temperature gradient obtained at different Reynolds number exhibit a different trend. These differences could be explained by the effect of differential electrical conductivities between the bulk and the deposit, and the balance between heat generation by electrical power dissipation and thermal loss by convection (with the fluid) and conduction (with the electrode surfaces).Significance for the science community and food industry
Food industry and in particularly the dairy industry, are faced with a severe problem due to equipment fouling during processing. Therefore, the development of alternative technologies for fouling limitation is of scientist and industrial relevance. Ohmic heating is one of these technologies, where the theoretical volume heating aspect should provide a considerable advantage to limit fouling phenomena. The present study evaluates the capability of a rectangular ohmic unit to provide a homogenous heat treatment of complexes dairy fluid (fluid rheology, flow rate and fouling presence).
Keywords: Ohmic heating; Dairy products; Temperature field; Rheology and fouling

Jianshen An, Min Zhang, Shaojin Wang, Juming Tang, Physical, chemical and microbiological changes in stored green asparagus spears as affected by coating of silver nanoparticles-PVP,

LWT - Food Science and Technology, Volume 41, Issue 6, July 2008, Pages 1100-1107, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.06.019.
(http://www.sciencedirect.com/science/article/B6WMV-4P47GT4-1/2/6926c9a7b3658fb4be150ea6614119d5)
Abstract:
Silver nanoparticles have recently gained increasing interests due to their antimicrobial activities in food processing applications. The aim of this study was to evaluate the effect of silver nanoparticles-PVP coating on weight loss, ascorbic acid, total chlorophyll, crude fiber, color, firmness and microbial qualities of asparagus spears stored at 2 and 10 [degree sign]C. Asparagus samples were first sanitized with 100 mg l-1 sodium hypochloride solution for 15 min. They were then immersed in coating solution containing silver nanoparticles for 3 min at room temperature. During 25-day storage at 2 or 10 [degree sign]C, the coated asparagus demonstrated lower weight loss, greener color and tender texture compared with the control samples. The growth of microorganism was significantly hindered by the coating. Based on comprehensive comparison and evaluation, asparagus spears coated by silver nanoparticles could be kept in good quality for 25 days at 2 [degree sign]C and for 20 days at 10 [degree sign]C.
Keywords: Asparagus officinalis L.; Silver nanoparticles; Polyvinylpyrrolidone; Coating; Storage; Quality

Wanwimol Klaypradit, Yao-Wen Huang, Fish oil encapsulation with chitosan using ultrasonic atomizer, LWT - Food Science and Technology, Volume 41, Issue 6, July 2008, Pages 1133-1139, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.06.014.
(http://www.sciencedirect.com/science/article/B6WMV-4P2J0FV-3/2/9fcdf942b48a9f29709374e868ec5d39)
Abstract:
An encapsulation technique was developed using an ultrasonic atomizer and three processing steps: emulsification, ultrasonic atomization, and freeze drying. Emulsion preparation variables such as concentration of wall materials [chitosan (CS), maltodextrin (MD) and whey protein isolate (WPI)] and tuna oil were optimized. The size and stability of the emulsion droplet and the properties of the encapsulated powders after freeze drying were characterized. At 20 g/100 g tuna oil, the optimum ratios of CS to MD and of CS to WPI were 1:10 and 1:1, respectively. There was a significant difference ($P<0.05$) in the emulsion particle sizes when the preparation conditions were varied. The combination of CS and MD giving the smallest particle size had the highest emulsion stability. The EPA and DHA content (240 mg/g) of the encapsulated powder were slightly higher than commercial specification (100 mg/g) and they had low moisture content and water activity, acceptable appearance and encapsulation efficiency. The ultrasonic technology used in this study could lead to application in the food industry improving the stability of tuna and other oils.
Keywords: Encapsulation; Emulsion; Ultrasonic atomizer; Tuna oil; Chitosan

Li Day, Robert B. Seymour, Keith F. Pitts, Izabela Konczak, Leif Lundin, Incorporation of functional ingredients into foods, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 6 June 2008, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.05.002.
(http://www.sciencedirect.com/science/article/B6VHY-4SP3SND-1/2/3831b5fbf4eb175d9de6f1939afaaa15)
Abstract:
The market for functional ingredients and foods has experienced growth in recent years due to the increased consumer awareness and promotion of healthy eating and lifestyle. Challenges remain to ensure that functional ingredients survive and remain `active' and `bioavailable' after food processing and storage. Food can be used as a vehicle for the delivery of bioactives and micronutrients at suitable levels that provide health benefits for increased wellbeing.

Demonstration of successful and effective incorporation of bioactives into foods is important for the commercialization of new bioactives and functional food ingredients. In this paper, dermatan sulphate and black carrot concentrate were used as model bioactive substances to demonstrate the approaches that can be taken for the development of functional ingredients and foods.

S. Mark Nelson, Joan S. Thullen, Aquatic macroinvertebrates associated with Schoenoplectus litter in a constructed wetland in California (USA), Ecological Engineering, Volume 33, Issue 2, 3 June 2008, Pages 91-101, ISSN 0925-8574, DOI: 10.1016/j.ecoleng.2007.12.012.
(http://www.sciencedirect.com/science/article/B6VFB-4SDFS4V-1/2/30589aafb394ae9a951cfc37dbc5b538)
Abstract:
Culm processing characteristics were associated with differences in invertebrate density in a study of invertebrates and senesced culm packs in a constructed treatment wetland. Invertebrate abundance differed by location within the wetland and there were differences between the two study years that appeared to be related to water quality and condition of culm material. Open areas in the wetland appeared to be critical in providing dissolved oxygen (DO) and food (plankton) to the important invertebrate culm processor, Glyptotendipes. As culm packs aged, invertebrate assemblages became less diverse and eventually supported mostly tubificid worms and leeches. It appears from this study that wetland design is vital to processing of plant material and that designs that encourage production and maintenance of high DO's will encourage microbial and invertebrate processing of material.
Keywords: Aquatic macroinvertebrates; Aquatic plant decomposition; Culm processing; Glyptotendipes sp.; Schoenoplectus spp.; Treatment wetland sustainability; Water quality; Wetland design

Barbara Kusznierewicz, Anna Smiechowska, Agnieszka Bartoszek, Jacek Namiesnik, The effect of heating and fermenting on antioxidant properties of white cabbage, Food Chemistry, Volume 108, Issue 3, 1 June 2008, Pages 853-861, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.11.049.
(http://www.sciencedirect.com/science/article/B6T6R-4R7RS9M-3/2/18f1d7be6dba9e7006f89c031728315e)
Abstract:
It is widely believed that natural antioxidants found in food are significantly lost during processing. Nevertheless, it was recently demonstrated that processed fruits and vegetables may retain their antioxidant activity. In the present work, the changes in the overall antioxidant properties as a consequence of fermentation of cabbage and/or heat treatment of cabbage juices and extracts were studied. Fermentation processes as well as heat treatment increased the initial values of antioxidant activity. While a decrease in the antioxidant potential of sauerkraut juice was found for short heat treatments, a partial recovery of these properties was observed by prolonging heating periods. The TLC analysis showed that during fermentation and thermal processes, some substances with reactivity towards Folin-Ciocalteu reagent, hence with possible antioxidant activity, were released. We demonstrated that in contrast to common expectation, typical culinary processing of cabbage increases its antioxidant potency. The gain in antioxidant activity of heated samples coincided with the formation of both F-C reagent reactive compounds as well as brown early Maillard reaction products. This information may encourage the consumption of heat processed cabbage, especially that the release of antioxidants during heating may prevent oxidation of other food components, e.g. fats.
Keywords: White cabbage; Antioxidant properties; Heat treatment; Fermentation

Wendy Hollands, Gary M. Brett, Pauline Radreau, Shikha Saha, Birgit Teucher, Richard N. Bennett, Paul A. Kroon, Processing blackcurrants dramatically reduces the content and does not

enhance the urinary yield of anthocyanins in human subjects, Food Chemistry, Volume 108, Issue 3, 1 June 2008, Pages 869-878, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.11.052.
(http://www.sciencedirect.com/science/article/B6T6R-4R7RS9M-5/2/8cc8d95ef405b578c8c569408af1a30a)
Abstract:
Blackcurrant (BC) fruits are a rich source of biologically active anthocyanins but little is known of the anthocyanin content of commonly consumed BC products or how processing affects the absorption. We report that whereas fresh and frozen whole BC were a rich source of anthocyanins, containing 897 and 642 mg (100 g FW)-1 of total anthocyanins the levels in all other products were substantially lower (0.05-10.3% of the levels in fresh fruit). Further, when the absorption and excretion of BC was assessed in volunteers consuming a portion (100 g) of frozen whole BC (642 mg total anthocyanins) and, 300 g of a BC drink made by diluting concentrated syrup (33.6 mg total anthocyanins), only small quantities of BC anthocyanins were excreted in urine (fruit, 0.053 +/- 0.022%; drink, 0.036 +/- 0.043%; mean percent urinary yield +/- SD) and they were not detected in plasma. These data indicate that fresh and frozen BC, but not processed products, are rich sources of anthocyanins but, regardless of the food source, these anthocyanins are poorly bioavailable.
Keywords: Flavonoids; Phenolics; Polyphenols; Bioavailability; Human metabolism

Yadahally N. Sreerama, Vadakkoot B. Sasikala, Vishwas M. Pratape, Nutritional implications and flour functionality of popped/expanded horse gram, Food Chemistry, Volume 108, Issue 3, 1 June 2008, Pages 891-899, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.11.055.
(http://www.sciencedirect.com/science/article/B6T6R-4R7RS9M-8/2/124c69b2e63d08dfc9f6a22da77d8ed2)
Abstract:
Utilization of horse gram and its flour in legume composite flours and products is limited due to the presence of antinutritional components, poor functional and expansion properties. Enzymatic treatment was used to improve the expansion and functional properties of horse gram to facilitate its use as an ingredient in food processing. Xylanase-mediated depolymerization of cell wall polysaccharides of horse gram lead to the development of a new expanded/popped horse gram. Expansion process of enzyme treated horse gram resulted in increased length (5.3-6.8 mm) and higher yield of expanded grains (63-98%). The expanded horse gram had lower bulk density, higher protein digestibility and more resistant starch compared to the control raw grains. Dietary fibre content of raw and processed horse gram was in the range of 14.57-16.14%. High temperature short time (HTST) conditions used during expansion process lowered the levels of phytic acid, tannins and protease inhibitors by 46%, 61% and 92%, respectively. The flour obtained from xylanase treated and expanded horse gram had higher water (204.3 g/100 g) and oil absorption capacities (98.4 g/100 g) than unprocessed flour, which had 135.8 g/100 g and 74.6 g/100 g, respectively at ambient conditions. There was a decrease in foaming capacity and foam stability in expanded gram flour. However, emulsion stability increased significantly in the processed samples. Thus, the study indicated that nutritional value and flour functionality of horse gram could be improved by processing it into a new expanded product that can be used as an ingredient in food processing.
Keywords: Horse gram; Macrotyloma uniflorum; Xylanase; Popped legume; Expanded dhal; Protein digestibility; Antinutritional factors; Functional properties

Eduvigis Roldan, Concepcion Sanchez-Moreno, Begona de Ancos, M. Pilar Cano, Characterisation of onion (Allium cepa L.) by-products as food ingredients with antioxidant and antibrowning properties, Food Chemistry, Volume 108, Issue 3, 1 June 2008, Pages 907-916, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.11.058.

(http://www.sciencedirect.com/science/article/B6T6R-4R8H1XX-2/2/4248a4ce68a2a1b242b5ef1c82a93c41)
Abstract:
Processing and stabilising onion wastes (residues and surpluses of onion) could solve the environmental problem derived from a great onion wastes disposal. Moreover, obtaining stabilised onion by-products as natural antioxidant food ingredients could be advantageous to food industry, not only to improve the use of onion wastes but also to obtain new natural and functional ingredients. The aim of this study was to characterise onion by-products - juice, paste and bagasse - from two Spanish onion cultivars - `Figueres' and `Recas' - that have been stabilised by thermal treatments - freezing, pasteurisation and sterilisation - in order to evaluate the effect of the processing and stabilisation treatment on the bioactive composition, antioxidant activity and polyphenol oxidase (PPO) enzyme inhibition capacity. The results obtained triggered to choose one onion by-product offering better characteristics for its potential development as a food ingredient: source of antioxidant and antibrowning bioactive compounds. In this study it was shown that processing of `Recas' onion wastes to obtain a paste (mixture content) and applying a mild pasteurisation were the best alternatives to obtain an interesting stabilised onion by-product with good antioxidant properties that made useful its use as functional food ingredient.
Keywords: Onion by-products; Stabilisation treatments; Freezing; Pasteurisation; Sterilisation; Bioactive compounds; Antioxidant; Enzymatic browning; Functional food ingredient

Giovanni D'Orazio, Alejandro Cifuentes, Salvatore Fanali, Chiral nano-liquid chromatography-mass spectrometry applied to amino acids analysis for orange juice profiling, Food Chemistry, Volume 108, Issue 3, 1 June 2008, Pages 1114-1121, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.11.062.
(http://www.sciencedirect.com/science/article/B6T6R-4RH8SMV-1/2/d2875a314f675ae9f7a27117da25c823)
Abstract:
Determination of amino acid enantiomers is a very important topic in food analysis, since the presence of d-isomers may indicate, e.g., adulteration, microbiological contamination, uncontrolled fermentation processes, etc. In fact, the d- and l-enantiomers contents can be a useful marker for several elements such as quality control, contamination detection, processing monitoring, etc. Here we studied the potentiality of nano-liquid chromatography (nano-LC) coupled with mass spectrometry for the enantiomeric separation of several d- and l-amino acids that can be found in food products. Analytes were derivatized with fluorescein isothiocyanate (FITC). The mixture was injected and compounds focused on a C18 cartridge, then nano-LC analysis was carried out in a capillary column (75 [mu]m i.d.) packed with vancomycin-modified silica-diol particles. The effect of some experimental parameters, such as pH and buffer concentration on enantioresolution and retention factors, was studied for method optimization. The chromatographic separation system was coupled with an ion-trap mass spectrometer through a nano spray interface. It provided a final evaluation on analytes detected in all investigated samples with LOD values as low as 8 ng/mL. That method was applied to the comparative analysis of two different orange juice samples (fresh natural vs. commercial one). Obtained profiles confirmed expected high quality standards. In fact, they mainly contained l-amino acids forms and not their antipodes.
Keywords: Amino acids; Derivatization; Chiral; Nano-liquid chromatography; Mass spectrometry

K. Godic Torkar, A. Vengust, The presence of yeasts, moulds and aflatoxin M1 in raw milk and cheese in Slovenia, Food Control, Volume 19, Issue 6, June 2008, Pages 570-577, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.06.008.
(http://www.sciencedirect.com/science/article/B6T6S-4P37JFM-2/2/1a152236054977ce702a6903cc1b4a15)
Abstract:

The level of microbiological contamination with yeasts and moulds in 60 samples of raw milk and 40 samples of curd, soft salted or non-salted cheese and semi-hard cheese manufactured by small artisan food-processing plants, collected in autumn and winter season was evaluated. The yeasts were present in 95.0% of raw milk samples with the mean concentration of 1.7 log10 cfu/ml. Moulds were found in 63.3% of raw milk samples, their mean concentration was 0.6 log10 cfu/ml. Isolated mould strains belonged to genera Geotrichum (51.5%), Aspergillus (33.8%), Mucor (5.9%), Fusarium (2.9%) and Penicillium (2.9%). Both, yeasts and moulds were isolated from 60% of tested cheese samples with average concentrations 2.5 log10 cfu/g and 2.1 log10 cfu/g, respectively. The genera Geotrichum (91.9%), Moniliella (5.4%) and Aspergillus (2.7%) were most frequently isolated strains from tested cheese samples. None of the isolated Aspergillus strains with typical growth on AFPA medium produced aflatoxin M1 on YES or YGC medium supplemented with Methyl-[beta]-cyclodextrin. The contamination with aflatoxin M1 in concentrations above 50 ng/kg was detected in 10% of cheese samples.
Keywords: Milk; Milk products; Yeasts; Moulds; Aflatoxin M1

Sergio Nieto-Montenegro, J. Lynne Brown, Luke F. LaBorde, Development and assessment of pilot food safety educational materials and training strategies for Hispanic workers in the mushroom industry using the Health Action Model, Food Control, Volume 19, Issue 6, June 2008, Pages 616-633, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.07.005.
(http://www.sciencedirect.com/science/article/B6T6S-4P5R5XM-1/2/e2362c3a307eaae798e07184afec39d8)
Abstract:
Evaluation of program impact is needed to show the worth of a program. There are few studies of training program impact on food safety behaviors within food production and processing settings. Our research objectives were to develop, implement and evaluate a pilot food safety educational program for Hispanic workers in the mushroom industry using the results of a needs assessment and elements from the knowledge and motivational systems of the Health Action Model (HAM). The impact of three independent variables was tested in the pilot test: (1) The food safety educational lessons (knowledge system); (2) the supervisors acting as role models and food safety rules encouragers (motivational system - expectancy & instrumentality); and (3) a monetary incentive (motivational system - valence). The dependent variables (behaviors), included three different handwashing opportunities plus jewelry and hairnet usage. The educational lessons alone produced a significant increase in knowledge and handwashing after using the restroom. With supervisor post lesson enforcement, handwashing before work and after breaks also increased significantly. No effect of the monetary incentive was observed. Thus, training must be followed by supervisory personnel enforcement of behavioral rules. Management support of the supervisory role will increase the success in any food safety program within the industry. Based on these findings the HAM model can serve as a guide to develop customized food safety educational materials at a variety of different settings and target audiences in food production facilities.
Keywords: Food safety; Training; Health Action Model; Theory; Hispanic; Produce; Industry; Mushrooms; Management; Enforcement

Maria Victoria Selma, Ana Maria Ibanez, Marita Cantwell, Trevor Suslow, Reduction by gaseous ozone of Salmonella and microbial flora associated with fresh-cut cantaloupe, Food Microbiology, Volume 25, Issue 4, June 2008, Pages 558-565, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.02.006.
(http://www.sciencedirect.com/science/article/B6WFP-4RY8SMR-1/2/441d385316d3684d3271e214e0e888e7)
Abstract:
This research investigates the efficacy of gaseous ozone, applied under partial vacuum in a controlled reaction chamber, for the elimination of Salmonella inoculated on melon rind. The performance of high dose, short duration treatment with gaseous ozone, in this pilot system, on

the microbial and sensory quality of fresh-cut cantaloupes was also evaluated. Gaseous ozone (10,000 ppm for 30 min under vacuum) reduced viable, recoverable Salmonella from inoculated physiologically mature non-ripe and ripe melons with a maximum reduction of 4.2 and 2.8 log CFU/rind-disk (12.6 cm2), respectively. The efficacy of ozone exposure was influenced by carrier matrix. Salmonella adhering to cantaloupe was more resistant to ozone treatment when suspended in skim-milk powder before aqueous inoculation to the rind. This indicated that organic matter interferes with the contact efficiency and resultant antimicrobial activity of gaseous ozone applied as a surface disinfectant. Conversely, in the absence of an organic carrier, Salmonella viability loss was greater on dry exocarp surfaces than in the wetted surfaces, during ozone treatment, achieving reductions of 2.8 and 1.4 initial log CFU/rind-disk, respectively. Gaseous ozone treatment of 5000 and 20,000 ppm for 30 min reduced total coliforms, Pseudomonas fluorescens, yeast and lactic acid bacteria recovery from fresh-cut cantaloupe. A dose Ct-value (concentration x exposure time) of 600,000 ppm min achieved maximal log CFU/melon-cube reduction, under the test conditions. Finally, fresh-cut cantaloupe treated with gaseous ozone, maintained an acceptable visual quality, aroma and firmness during 7-day storage at 5 [degree sign]C. Conclusions derived from this study illustrate that gaseous ozone is an effective option to risk reduction and spoilage control of fresh and fresh-cut melon. Moreover, depending on the timing of contamination and post-contamination conditions, rapid drying combined with gaseous ozone exposure may be successful as combined or sequential disinfection steps to minimize persistence of Salmonella on the surface of cantaloupe melons and transference during fresh-cut processing of home preparation. Based on these results, greater efficacy would be anticipated with mature but non-ripe melons while ripe tissues reduce the efficacy of these gaseous ozone treatments, potentially by oxidative reaction with soluble refractive solids.
Keywords: Sanitizing; Sensory quality; Foodborne pathogens; Melon; Fruits; Food safety

Chong Wei Jin, Shao Ting Du, Kai Zhang, Xian Yong Lin, Factors determining copper concentration in tea leaves produced at Yuyao County, China, Food and Chemical Toxicology, Volume 46, Issue 6, June 2008, Pages 2054-2061, ISSN 0278-6915, DOI: 10.1016/j.fct.2008.01.046.
(http://www.sciencedirect.com/science/article/B6T6P-4RS43PV-2/2/603815e4faa25ec7d1e892c91ba99cbe)
Abstract:
Over consumption of copper (Cu) from food and beverages is detrimental to human health. In this study, we investigated Cu accumulation in tea leaves produced in Yuyao County in China. Copper concentrations in all tea leaves sampled from tea gardens were below 60 mg kg-1, the permissible level given by the Chinese Ministry of Health; however, 15% of the samples were over 15 mg kg-1, the allowable level of `green food' as defined by the Chinese Ministry of Agriculture. These observations indicate that Cu concentrations in tea leaves from the investigated producing areas are acceptable, but still a concern. To understand what factors affect the Cu accumulation in the tea leaves, we further analyzed soils from the tea gardens for Cu availability, pH and organic matter content. The Cu availability in soil was found to be closely correlated with the soil's H+ activity, followed by organic matter content. The soils in the tea gardens were also found to be severely acidic with the lowest pH of 3.58. The tea garden soils, if fertilized with animal manure, could also contribute to the risk of Cu contamination. Additionally, Cu concentrations in the final products of tea leaves were greatly increased by the machinery processing in factories that used copper boards at the twisting stage. In one factory, the Cu level was increased by 32.1 mg kg-1. This study suggests that both edaphic and non-edaphic factors can contribute to the final Cu accumulation in tea leaves used by consumers.
Keywords: Cu bioavailability; Organic matter; Processing stage; Soil pH; Tea garden

C. Frontela, F.J. Garcia-Alonso, G. Ros, C. Martinez, Phytic acid and inositol phosphates in raw flours and infant cereals: The effect of processing, Journal of Food Composition and Analysis, Volume 21, Issue 4, June 2008, Pages 343-350, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.02.003.
(http://www.sciencedirect.com/science/article/B6WJH-4S03RF1-2/2/b250da08958c19e364181292bfb16aaa)
Abstract:
Inositol phosphate modification in infant cereals was examined during industrial processing which included roasting and alpha-amylase treatment. A considerable ($p<0.05$) decrease in phytate content was observed after both treatments in all the samples analysed. However, the industrial processing observed was not sufficient to cause degradation of the phytate to achieve phytate mineral ratios optimal for mineral absorption in infant cereals. All samples analysed had a phytate/iron molar ratio >1.3, and of the 6 samples, 5 had a phytate/zinc molar ratio >14. The bioavailability of minerals is particularly important during weaning when minerals stores in infants are naturally low. Further studies are needed to evaluate the efficacy and effectiveness of phytase treatment to increase mineral bioavailability in infant foods.
Keywords: Infant flour; Infant cereal; Infant nutrition; Industrial processing; Roasting; Alpha-amylase; Phytate; Bioavailability; Iron; Calcium; Zinc

Dah-Jye Lee, Robert Schoenberger, James Archibald, Steve McCollum, Development of a machine vision system for automatic date grading using digital reflective near-infrared imaging, Journal of Food Engineering, Volume 86, Issue 3, June 2008, Pages 388-398, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.10.021.
(http://www.sciencedirect.com/science/article/B6T8J-4R17TRF-6/2/b26120a44eaee1c24c7828a06f70a87b)
Abstract:
Quality evaluation of agricultural and food products is important for processing, inventory control, and marketing. Fruit size and skin delamination are two important quality factors for the date industry, especially for high quality dates such as Medjools. Unlike other near-infrared spectrometric approaches, the developed machine vision system uses reflective near-infrared imaging to evaluate date quality by analyzing two-dimensional images. This paper presents the development and test results of a machine vision system for automatic date quality evaluation for commercial production. Near-infrared imaging, vision algorithms, and a variety of operational details of the system, including cameras, optics, illumination, electronics, control, and fruit carrier are presented. The complete machine vision system has been built, field tested, and installed in a date packing facility. Relative to manual grading, the operational system results in improved grading accuracy and a substantial reduction in operating costs.
Keywords: Reflective near-infrared; Non-destructive inspection; Skin delamination; Real-time machine vision; Date grading

M.F. Villacis, N.K. Rastogi, V.M. Balasubramaniam, Effect of high pressure on moisture and NaCl diffusion into turkey breast, LWT - Food Science and Technology, Volume 41, Issue 5, June 2008, Pages 836-844, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.05.018.
(http://www.sciencedirect.com/science/article/B6WMV-4NX2NPY-3/2/a0dabb1146fa4dc6a7752ebb3fdeab33)
Abstract:
High-pressure processing (HPP) affects food component diffusion. This study evaluated pressure (0.1-300 MPa) effect on the diffusion of NaCl and water into turkey breast at 25 [degree sign]C. NaCl and water diffusion were found to be a function of pressure and holding time. During the pressure come-up-time, diffusion of water and NaCl into the sample was enhanced as compared to control. The diffusion coefficient of moisture infusing out of the sample was found to be a

minimum at 150 MPa. The diffusion coefficient of NaCl infusing into the sample was maximum at 150 MPa. Within the range of experimental conditions studied, 150 MPa treatment (up to 15 min holding time) yielded meat samples with minimum hardness, gumminess, and chewiness. Ultrastructure images revealed that 150 MPa treatments caused swelling of myofibrils, disappearance of the M-line, reduced difference in the density of the A-band and I-band and breaking of segments of Z-line. HPP could be a useful technique for the salting of turkey meat.
Keywords: High-pressure processing; Mass transfer; Turkey breast; Salting; Texture

E. Cummins, F. Butler, R. Gormley, N. Brunton, A methodology for evaluating the formation and human exposure to acrylamide through fried potato crisps, LWT - Food Science and Technology, Volume 41, Issue 5, June 2008, Pages 854-867, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.05.022.
(http://www.sciencedirect.com/science/article/B6WMV-4P0DJWX-1/2/a2b7bc7692ac3734e1d0b076a8141401)
Abstract:
Potato crisps are a popular snack food which have been implicated as a potential source of acrylamide. This study develops a farm-to-fork human exposure assessment model for acrylamide in fried potato crisps for Irish consumers. The model used Monte Carlo simulation techniques to model the various stages from on farm production of potatoes, storage, processing, crisp production and final human consumption of potato crisps. A baseline model is created and a number of scenarios are subsequently created to look at the impact of different model assumptions and input parameters. The baseline model found that the mean level of acrylamide in potato crisps in Ireland was 720 [mu]g/kg. Irish consumer exposure to acrylamide in potato crisps was estimated to be 0.052 and 0.064 [mu]g/kg bw/day for males and females, respectively. A sensitivity analysis revealed the important parameters influencing the model predictions. The initial level of reducing sugars was found to be the most important parameter (correlation coefficient 0.58 and 0.57 for glucose and fructose, respectively), highlighting the importance of selecting cultivars with low reducing sugar levels for crisp production. The cooking regime had a significant impact on model predictions, highlighting the need for further research into the impact of different time and temperature combinations. Blanching and soaking of potatoes were also identified as important risk reduction processes.
Keywords: Risk assessment; Acrylamide; Potato crisp; Simulation

Kuan-Hung Lin, Hongyong Fu, Cheng-Han Chan, Hsiao-Feng Lo, Ming-Chih Shih, You-Ming Chang, Long-Fang O. Chen, Generation and analyses of the transgenic potatoes expressing heterologous thermostable [beta]-amylase, Plant Science, Volume 174, Issue 6, June 2008, Pages 649-657, ISSN 0168-9452, DOI: 10.1016/j.plantsci.2008.04.001.
(http://www.sciencedirect.com/science/article/B6TBH-4S8CR1D-3/2/9b062d689a3bb64cc9b6e7b2b34a8f80)
Abstract:
[beta]-Amylase hydrolyzes the [alpha]-1,4-glycosidic linkages of starch resulting in the release of maltose. This reaction is of industrial importance for maltose production and for the preparation process of fermented foods and alcoholic beverages. A demand for an acceleration of the rate of enzymatic cleavage of the starch macro-molecule is a prerequisite for large-scale and highly efficient production. Increasing the temperature up to the optimum of approximately 60 [degree sign]C can significantly speed up the reaction. However, at higher temperatures, the effect on protein denaturation becomes dominant, and the conversion rate decreases. The primary objective of this study was to generate transgenic plants of the 'Kennebec' potato variety for production of thermostable [beta]-amylase using Agrobacterium-mediated transformation. Four chimeric genes encoding the [beta]-amylase with or without signal peptide sequences for targeting expression in cytoplasm, amyloplasts, or vacuoles were constructed and driven by high tuber expression

promoter from Sucrose synthetase gene Sus4. Forty-two transgenic lines were selected for this study. Transgenic lines with various [beta]-amylase constructs were verified for the existence and expression of the transgenes by PCR approaches. The expression level of the introduced [beta]-amylase protein was estimated by immunoblot analyses using polyclonal antibodies. Recombinant [beta]-amylase was successfully expressed in Escherichia coli B21 (DE3), and temperature ranges of these inducible recombinant proteins were found to be between 40 and 90 [degree sign]C. This enzymatic complex produced in the in vitro cultured microtubers and field-grown tubers from transgenic potatoes were proved to be stable and active at 60 [degree sign]C. The relative activities of [beta]-amylase in tubers of field-grown potatoes were compared, and the maximum increase was found with transgenic line #6A of the pSUS4-AMY construct which has an 11-fold greater increase than the untransformed 'Kennebec'. Variations of the chemical compositions were found in the selected transgenic lines. Results of this study suggest the feasibility of utilizing thermostable [beta]-amylase in transgenic potatoes for the starch-processing industries.
Keywords: Thermostability; [beta]-Amylase; Transgenic potato

A. Mizrach, Ultrasonic technology for quality evaluation of fresh fruit and vegetables in pre- and postharvest processes, Postharvest Biology and Technology, Volume 48, Issue 3, June 2008, Pages 315-330, ISSN 0925-5214, DOI: 10.1016/j.postharvbio.2007.10.018.
(http://www.sciencedirect.com/science/article/B6TBJ-4RW4RXN-1/2/b5a54cca4aa82c0ab62c19282a07337f)
Abstract:
Increasing public demands for improved quality of fruit and vegetables in the fresh market and the food industry, and growers' expectations of high prices for premium quality products, raise the necessity for fast, accurate, and objective methods for measuring and monitoring product quality along the chain of pre- and postharvest processes, from the field to the consumer. Ultrasound technology provides one of the foundations for a non-destructive, fast and reliable technique for correlating specific quality-related indices and characteristics of fruit and vegetables with the stages of development during growth and maturation, and in the course of storage and shelf-life, until they are ready for consumption. This review summarizes the last two decades of studies, adaptation, modification, and innovation of ultrasound technology and devices for determination of material properties of fresh fruit and vegetable tissues, in both pre- and postharvest applications. Included are descriptions of the various methods of ultrasonic measurement, the equipment, the procedures for data processing and correlating the measurements of ultrasound parameters with quality indices of fruit and vegetables in the course of the various pre- and postharvest processes. It is concluded that much progress has been made in these fields during recent years.
Keywords: Shelf-life; Ripeness; Firmness; Attenuation

David R. Wilson, Lukasz Dabrowski, Sandra Stringer, Roy Moezelaar, Tim F. Brocklehurst, High pressure in combination with elevated temperature as a method for the sterilisation of food, Trends in Food Science & Technology, Volume 19, Issue 6, NovelQ - High Pressure Processing, June 2008, Pages 289-299, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.01.005.
(http://www.sciencedirect.com/science/article/B6VHY-4RNR6WC-3/2/f9df68486ca0cf37211ffe2790567c29)
Abstract:
Application of high-pressure processing to foods can effect a decrease in the number of vegetative bacterial cells, and hence can result in pasteurisation. Inactivation of bacterial spores, however, is required for the sterilisation of foods. This article reviews the current status of the application of high-pressure treatments for the inactivation of bacterial spores, and particularly examines the requirement for a combination of high pressure and high temperature processing to achieve the sterilisation of foods.

Indrawati Oey, Iesel Van der Plancken, Ann Van Loey, Marc Hendrickx, Does high pressure processing influence nutritional aspects of plant based food systems?, Trends in Food Science & Technology, Volume 19, Issue 6, NovelQ - High Pressure Processing, June 2008, Pages 300-308, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.09.002.
(http://www.sciencedirect.com/science/article/B6VHY-4PR8P6N-3/2/ac9a9674b1850d5dd6c488d586e62e79)
Abstract:
High pressure (HP) technology could maintain food quality attributes such as colour, flavour and nutritional values due to its limited effects on covalent bonds. Under pressure, (bio)chemical reactions can also be induced and it could affect those quality attributes, e.g., nutrition value. In this article, the effects of HP on the stability and bioavailability of vitamins in plant based food systems especially in fruit and vegetables are briefly reviewed. Since HP treatment influences the vitamin stability and the extraction yield of some bioactive compounds, its impacts on antioxidant capacity are also further discussed. In this review, the degradation mechanisms of some vitamins during HP treatment are postulated based on current findings. In addition, possible impacts of conducting HP treatment at elevated temperature (such as HP sterilization) on vitamin stability are discussed.

Daniel N. Sila, Thomas Duvetter, Ans De Roeck, Isabel Verlent, Chantal Smout, Graham K. Moates, Brian P. Hills, Keith K. Waldron, Marc Hendrickx, Ann Van Loey, Texture changes of processed fruits and vegetables: potential use of high-pressure processing, Trends in Food Science & Technology, Volume 19, Issue 6, NovelQ - High Pressure Processing, June 2008, Pages 309-319, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.12.007.
(http://www.sciencedirect.com/science/article/B6VHY-4RDS414-1/2/c4e1cca88c71fa99173637dbf499cb3b)
Abstract:
In processed fruits and vegetables, changes in texture are strongly related to transformations in cell wall polymers due to enzymatic and non-enzymatic reactions. A major challenge is how to use recent advances in processing technologies and to adjust raw materials, ingredients and processes to improve texture of processed plant based foods.
This review focuses on the plant cell wall structure and the processing dependent changes in plant cell walls with focus on enzymatic and non-enzymatic degradation of pectin. Stability as well as catalytic activity of two major plant endogenous pectin degrading enzymes, namely pectinmethylesterase and polygalacturonase, towards elevated pressure and temperature is reviewed. Finally, the effect of processing on texture of plant based foods and different approaches to improve the texture of processed plant based foods (i.e. preheating, phenolics, washing/dipping/infusion pretreatments, high-pressure pretreatments and genetic modification) are discussed.

Indrawati Oey, Martina Lille, Ann Van Loey, Marc Hendrickx, Effect of high-pressure processing on colour, texture and flavour of fruit- and vegetable-based food products: a review, Trends in Food Science & Technology, Volume 19, Issue 6, NovelQ - High Pressure Processing, June 2008, Pages 320-328, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.04.001.
(http://www.sciencedirect.com/science/article/B6VHY-4S80XFG-2/2/49e3dc3e0c858d96408b8e6d6a6d2011)
Abstract:
Colour, flavour and texture are important quality characteristics of fruits and vegetables and major factors affecting sensory perception and consumer acceptance of foods. Various processing methods are used not only to increase the edibility and palatability of fruits and vegetables but also to prolong their shelf life. High-pressure (HP) processing is an interesting alternative to traditional food processing and preservation methods due to its limited effects on covalent bonds resulting in

minimal modifications in nutritional and sensory quality. This review focuses specifically on the effects of HP treatment on colour, flavour and texture of fruit- and vegetable-based foods and tries to elucidate the mechanisms behind the observed changes in quality attributes. Possible impacts of HP treatments at elevated temperatures on these sensory properties are also highlighted since the temperature regime used for research on high pressure (HP) has been extended to elevated temperatures in order to achieve spore inactivation (e.g. HP sterilization).

M.B. Peyrat, C. Soumet, P. Maris, P. Sanders, Recovery of Campylobacter jejuni from surfaces of poultry slaughterhouses after cleaning and disinfection procedures: Analysis of a potential source of carcass contamination, International Journal of Food Microbiology, Volume 124, Issue 2, 31 May 2008, Pages 188-194, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.03.030.
(http://www.sciencedirect.com/science/article/B6T7K-4S5VCG0-6/2/971fe81f993efa53c83e773c04b7e7bc)
Abstract:
Campylobacters are a primary cause of human bacterial enteritis worldwide. They are usually considered susceptible to the disinfectant molecules used in the food industry. The purpose of this study was to see if campylobacters could survive cleaning and disinfection in poultry slaughterhouses and whether the strains recovered could contaminate carcasses during processing. Samples obtained from the environment before and after cleaning and disinfection (transport crates, processing equipment surfaces, scald tank water) and from birds (fresh droppings, neck skins) were collected during 7 investigations in 4 different slaughterhouses. Out of 41 samples collected, 30 Campylobacter jejuni strains were recovered from the surfaces of processing equipment before cleaning and disinfection procedures in three slaughterhouses and 9 C. jejuni out of 51 samples collected were found after cleaning. The study was then focused on one slaughterhouse to trace passage of the pathogen on poultry carcasses. The antimicrobial resistance phenotypes (P) (minimum inhibitory concentration, MIC) of the C. jejuni isolates collected in this slaughterhouse were determined. Nine phenotypes could be distinguished. Three of these were of interest as they were found in isolates recovered after cleaning and disinfection procedures. The genotypes (G) were determined by polymerase chain reaction and restriction fragment length polymorphism (PCR-RFLP) of isolates with one of the three phenotypes of interest. Clusters constructed by combining the phenotype and genotyping observations (P * G type) were compared between isolates obtained after cleaning and disinfection, and isolates from droppings, neck skin and transport crate samples of slaughtered poultry flocks. Only one P * G type of strain was recovered from surfaces after cleaning and disinfection and from neck skin samples but was also recovered from transport crates. Our findings indicate that C. jejuni is able to survive overnight on food processing equipment surfaces, after cleaning and disinfection procedures, and that these strains may contaminate carcasses during the slaughter process. These results add to our understanding of poultry carcass contamination and highlight the need to develop ways of reducing the risk of human infection with Campylobacter through the consumption of poultry products.
Keywords: Campylobacter; Poultry; Slaughterhouse; PCR-RFLP; Disinfection; Survival

Peter G. Beninger, Alexandra Valdizan, Priscilla Decottignies, Bruno Cognie, Impact of seston characteristics on qualitative particle selection sites and efficiencies in the pseudolamellibranch bivalve Crassostrea gigas, Journal of Experimental Marine Biology and Ecology, Volume 360, Issue 1, 28 May 2008, Pages 9-14, ISSN 0022-0981, DOI: 10.1016/j.jembe.2008.03.003.
(http://www.sciencedirect.com/science/article/B6T8F-4SC5PVD-2/2/230b96e605153f0ff2d6eee191837a4e)
Abstract:
To date, knowledge of the qualitative particle selection sites and conditions in the widely-distributed bivalve Crassostrea gigas is incomplete, having focussed either on heterogeneous

particles, or on particles intentionally too large to enter the gill principal filament tracts. We used endoscope-directed sampling and the intact diatom-empty, cleaned frustule approach to unambiguously establish qualitative selection sites and the influence of seston quality (varying proportions of intact diatoms and empty, cleaned frustules) and quantity (particle loads) on the degree of qualitative selection. Normally-feeding oysters were presented test mixtures of the naturally-occurring Actinoptychus senarius (small enough to enter the gill principal filaments), and the potential selection sites (gill: dorsal and ventral collecting tracts; labial palps: anteriorly-deposited pseudofaeces), were sampled for comparison with the proportions and concentrations of the ambient medium. Qualitative selection was demonstrated at both the gills and labial palps. Gill selection efficiency was shown to be directly proportional to seston quality and quantity, using a technique independant of pseudofeces mucus content. The oyster gill is thus able to increase ingested food quality when environmental food quality is low and / or when seston concentrations are high, which is typical of oyster habitats. Palp selection efficiency was directly proportional to seston quality, but at the highest concentration tested, no qualitative selection was observed on the labial palps, probably due to overload on these smaller organs. The partial functional redundancy of these key processing organs in heterorhabdic species such as oysters and scallops may enhance their success in high-turbidity habitats.
Keywords: Bivalves; Diatoms; Endoscopy; Feeding; Oysters; Selection; Seston

Robson Maia Geraldine, Nilda de Fatima Ferreira Soares, Diego Alvarenga Botrel, Leticia de Almeida Goncalves, Characterization and effect of edible coatings on minimally processed garlic quality, Carbohydrate Polymers, Volume 72, Issue 3, 16 May 2008, Pages 403-409, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.09.012.
(http://www.sciencedirect.com/science/article/B6TFD-4PPMXPB-1/2/bdb4c58ddd50dc0e691edfca49ea1aef)
Abstract:
The main benefits of edible active coatings are their edible characteristics, biodegradability and increase in food safety. In this study the physical properties of the agar-agar based (1%) coatings incorporated with 0.2% chitosan and 0.2% acetic acid, as well as their effects on coating of minimally processed garlic cloves were evaluated. Moisture loss of coated garlic cloves was, on average, three times lower when compared to the control samples (no coated garlic cloves). There was a marked increase in color difference values ([Delta]E*) for control cloves compared to the other treatments. Filamentous fungis and aerobic mesophilic were inhibited on garlic cloves coating incorporated with acetic acid + chitosan antimicrobial compounds. During 6 days-storage, at 25 [degree sign]C, the filamentous fungis and yeasts count was maintained between in 102 and 103 CFU g-1 for the coated garlic cloves and around 106 CFU g-1 for the control. The coatings provided significant reduction ($p < .05$) in clove respiration. Coated garlic cloves, had a respiration rate ([approximate]30 mg CO_2 h-1 kg-1) halved compared to the non-coated garlic cloves. Water vapor transmission was lower for the films added with chitosan. These films showed no visible color difference, possibly because of the reduced thickness, since chitosan films tend to have a more intense shade.
Keywords: Agar; Edible coating; Chitosan; Garlic; Minimal processing

J.M. Wagacha, J.W. Muthomi, Mycotoxin problem in Africa: Current status, implications to food safety and health and possible management strategies, International Journal of Food Microbiology, Volume 124, Issue 1, 10 May 2008, Pages 1-12, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.01.008.
(http://www.sciencedirect.com/science/article/B6T7K-4RNJ8JJ-1/2/2e7238c8c8f8ef83bf55f35d3910fa4b)
Abstract:

Mycotoxins are toxic secondary metabolites of fungal origin and contaminate agricultural commodities before or under post-harvest conditions. They are mainly produced by fungi in the Aspergillus, Penicillium and Fusarium genera. When ingested, inhaled or absorbed through the skin, mycotoxins will cause lowered performance, sickness or death on humans and animals. Factors that contribute to mycotoxin contamination of food and feed in Africa include environmental, socio-economic and food production. Environmental conditions especially high humidity and temperatures favour fungal proliferation resulting in contamination of food and feed. The socio-economic status of majority of inhabitants of sub-Saharan Africa predisposes them to consumption of mycotoxin contaminated products either directly or at various points in the food chain. The resulting implications include immuno-suppression, impaired growth, various cancers and death depending on the type, period and amount of exposure. A synergistic effect between mycotoxin exposure and some important diseases in the continent such as malaria, kwashiorkor and HIV/AIDS have been suggested. Mycotoxin concerns have grown during the last few decades because of their implications to human and animal health, productivity, economics of their management and trade. This has led to development of maximum tolerated limits for mycotoxins in various countries. Even with the standards in place, the greatest recorded fatal mycotoxin-poisoning outbreak caused by contamination of maize with aflatoxins occurred in Africa in 2004. Pre-harvest practices; time of harvesting; handling of produce during harvesting; moisture levels at harvesting, transportation, marketing and processing; insect damage all contribute to mycotoxin contamination. Possible intervention strategies include good agricultural practices such as early harvesting, proper drying, sanitation, proper storage and insect management among others. Other possible interventions include biological control, chemical control, decontamination, breeding for resistance as well as surveillance and awareness creation. There is need for efficient, cost-effective sampling and analytical methods that can be used for detection analysis of mycotoxins in developing countries.
Keywords: Aflatoxins; Africa; Contamination; Fumonisins; Mycotoxins; Ochratoxins

Stefan Willfor, Kenneth Sundberg, Maija Tenkanen, Bjarne Holmbom, Spruce-derived mannans - A potential raw material for hydrocolloids and novel advanced natural materials, Carbohydrate Polymers, Volume 72, Issue 2, 5 May 2008, Pages 197-210, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.08.006.
(http://www.sciencedirect.com/science/article/B6TFD-4PF6B54-2/2/2fd229a0ce9fb01c63a8aee1fe228cc0)
Abstract:
The history, analysis, recovery, and utilization of O-acetylgalactoglucomannans (AcGGM for short), which is the main hemicellulose present in softwoods, is reviewed. The water-soluble and hence easily extractable AcGGM from Norway spruce (Picea abies) is especially in focus. The influence of different extraction and purification methods on the yield and structure of AcGGM is discussed. Mild structure-preserving processing is vital to maintain the acetyl groups. Without acetyl groups, the water-solubility is decreased due to molecular orientation and the formation of inter- and intramolecular hydrogen bonds. Specific enzymes acting on AcGGM can be useful in targeted modifications, as well as in structure elucidation and structure-function studies. Large-scale recovery methods are also compared. Of particular interest is the recovery of dissolved AcGGM from process waters in mechanical pulp mills using Norway spruce as raw material. AcGGM has promising biological activity and physico-chemical properties suitable for various applications in, for example, food, health, papermaking, textile, and cosmetic industries.
Keywords: Enzymes; GGM; Isolation; Mannans; O-Acetyl galactoglucomannans; Recovery; Spruce; Wood

Andrea Versari, Giuseppina P. Parpinello, Alessia U. Mattioli, Sergio Galassi, Characterisation of Italian commercial apricot juices by high-performance liquid chromatography analysis and

multivariate analysis, Food Chemistry, Volume 108, Issue 1, 1 May 2008, Pages 334-340, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.10.053.
(http://www.sciencedirect.com/science/article/B6T6R-4R06434-1/2/7fe6a67646be3f81d9eee326e9d7d80c)
Abstract:
The modern fruit juice industry needs their products to be characterized by high-quality attributes to meet consumers' expectation. In this view, the composition of 26 Italian commercial apricot juices obtained from organic, integrated and conventional agriculture was analysed for carbohydrates, organic acids, amino acids, phenolic compounds and furanic compounds by high-performance liquid chromatography (HPLC). The content of 5-hydroxymethylfurfural in apricot juices (range 0.1-18 mg/l) was within the regulatory limit of 20 mg/l. The lack of furanic compounds in apricot fresh fruits confirmed their importance as quality markers of heating condition during processing and storage of fruit juices. Univariate analysis disclosed some significant differences among the composition of the apricot juices in terms of glucose, fructose, malic acid, glycine, chlorogenic acid, rutin, and a*-parameter (redness). Principal component analysis on chemical composition of apricot juices resulted in two principal components (PCs) that accounted for 66% of the total variance. Organic apricot juices showed some separation from the other juices, whereas a lack of distinction between integrated and conventional juices appeared.
Keywords: Apricot juice; Compositional data; HPLC; Organic foods; PCA

Wan-Seob Cho, Beom Seok Han, Hakyung Lee, Cheulkyu Kim, Ki Taek Nam, KiDae Park, Mina Choi, Sung Jun Kim, Seung Hee Kim, Jayoung Jeong, Dong Deuk Jang, Subchronic toxicity study of 3-monochloropropane-1,2-diol administered by drinking water to B6C3F1 mice, Food and Chemical Toxicology, Volume 46, Issue 5, May 2008, Pages 1666-1673, ISSN 0278-6915, DOI: 10.1016/j.fct.2007.12.030.
(http://www.sciencedirect.com/science/article/B6T6P-4RMNYK9-1/2/7edebce4f5604fdbbd78d7d90cb2cdaa)
Abstract:
3-Monochloropropane-1,2-diol (3-MCPD) is a food processing contaminant in a wide range of foods and ingredients and is a suspected cause of cancer. In this study, the 13-week toxicity of 3-MCPD was examined in B6C3F1 mice (10/sex/group) administered 3-MCPD doses of 0, 5, 25, 100, 200 and 400 ppm dissolved in their drinking water over a 13-week period. All the mice survived to the end of study. The mean body weight gains in the males and females given 400 ppm were significantly lower than those of the controls. The relative kidney weights of the males and females given 200 and 400 ppm were significantly higher than those of the controls without any corresponding histopathological changes. The sperm motility was lower in the 400 ppm group than the control, and there was a significant increase in the incidence of germinal epithelium degeneration in the 200 and 400 ppm groups. A delayed total estrus cycle length was observed in the 400 ppm group without any histopathological changes. Based on these results, the target organ was determined to be kidney, testis, and ovary. The no-observed-adverse-effect level (NOAEL) was found to be 100 ppm (18.05 mg/kg/day for males and 15.02 mg/kg/day for females).
Keywords: 3-monochloropropane-1,2-diol; B6C3F1 mice; Toxicity; No-observed-adverse-effect level

Thais Terumi Maruyama, Aldo Ivan Cespedes Arce, Livia Pereira Ribeiro, Ernane Jose Xavier Costa, Time-frequency analysis of acoustic noise produced by breaking of crisp biscuits, Journal of Food Engineering, Volume 86, Issue 1, May 2008, Pages 100-104, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.09.015.
(http://www.sciencedirect.com/science/article/B6T8J-4PPW6SS-1/2/0ebf1255fa050af0818247d0fb6e8207)
Abstract:

This paper demonstrates by means of joint time-frequency analysis that the acoustic noise produced by the breaking of biscuits is dependent on relative humidity and water activity. It also shows that the time-frequency coefficients calculated using the adaptive Gabor transformation algorithm is dependent on the period of time a biscuit is exposed to humidity. This is a new methodology that can be used to assess the crispness of crisp foods.
Keywords: Sound; Texture; Signal processing

A. Nath, P.K. Chattopadhyay, Effect of process parameters and soy flour concentration on quality attributes and microstructural changes in ready-to-eat potato-soy snack using high-temperature short time air puffing, LWT - Food Science and Technology, Volume 41, Issue 4, May 2008, Pages 707-715, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.05.001.
(http://www.sciencedirect.com/science/article/B6WMV-4NR18P1-1/2/125b14fb4cbbc205f6787ca6eef6417d)
Abstract:
High-temperature short time (HTST) air puffing has been found to be very useful process for production of potato-soy ready-to-eat snack food as it ideally produced highly porous and light texture. The process parameters considered viz. puffing temperature (185-255 [degree sign]C) and puffing time (20-60 s) with constant initial moisture content of 36.74% and air velocity of 3.99 m/s for potato-soy blend with varying soy flour content from 5% to 25% were investigated using response surface methodology with central composite rotatable design (CCRD). The optimum product in terms of maximum expansion ratio (3.69), minimum hardness (2754.3 g) and maximum overall acceptability (7.3) were obtained with 10.31% soy flour blend in potato flour at the process conditions of puffing temperature (230.06 [degree sign]C) and puffing time (25.46 s). Microstructural changes were evaluated at different stages (with an interval of 5 s) of HTST puffing for product obtained with the optimum processing conditions. The maximum expanded porous structures with larger cracks and smaller pits were recorded in the SEM micrographs at 20 s of HTST air puffing.
Keywords: Microstructure; Scanning electron microscope; Puffing; High-temperature short time; Ready-to-eat snack food

Pakorn Luangmalawat, Somkiat Prachayawarakorn, Adisak Nathakaranakule, Somchart Soponronnarit, Effect of temperature on drying characteristics and quality of cooked rice, LWT - Food Science and Technology, Volume 41, Issue 4, May 2008, Pages 716-723, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.04.010.
(http://www.sciencedirect.com/science/article/B6WMV-4NTB9CB-1/2/d852c535f8d1e535f433775d3da1114f)
Abstract:
A shorter drying time, together with acceptable product quality, is preferred in food processing. To accomplish this requirement, the present work was studied on the effect of temperature on drying kinetics and quality of cooked rice. The long grain-jasmine rice was chosen as a raw material. The experiments were carried out at temperatures of 50, 60, 80, 100 and 120 [degree sign]C. Effective diffusion coefficient was determined experimentally using a method of slopes. An empirical equation was developed to describe the effective diffusion coefficient as a function of temperature and moisture content. The developed equation was utilized to predict moisture content as the drying progressed and the prediction agreed with the experimental result relatively well. For the quality, the drying temperature affected the color of cooked rice, but it insignificantly affected shrinkage and rehydration capability of dried cooked rice. As examined by scanning electron microscope, morphologies of cooked rice dried at temperatures were similar, but they were relatively different to that of freshly cooked rice, with slightly more porous material after processing.
Keywords: Biological material; Drying; Instant rice; Quality

Avelino Alvarez-Ordonez, Ana Fernandez, Mercedes Lopez, Ricardo Arenas, Ana Bernardo, Modifications in membrane fatty acid composition of Salmonella typhimurium in response to growth conditions and their effect on heat resistance, International Journal of Food Microbiology, Volume 123, Issue 3, 30 April 2008, Pages 212-219, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.01.015.
(http://www.sciencedirect.com/science/article/B6T7K-4RSRDB1-1/2/549655c520cccce4cd2c86d0324a5212)
Abstract:
The effects of growth temperature (in the range 10-45 [degree sign]C) and acidification up to pH 4.5 of the culture medium (Brain Heart Infusion, BHI) with different organic acids (acetic, citric and lactic) and hydrochloric acid on membrane fatty acid composition and heat resistance of Salmonella typhimurium CECT 443 were studied. The heat resistance was maximal in cells grown at 45 [degree sign]C (cells grown in non-acidified BHI showed a D58-value of 0.90 min) and decreased with decreasing growth temperature up to 10 [degree sign]C (D58-value of 0.09 min). The growth of cells in acidified media caused an increase in their heat resistance. In general, acid adapted cells showed D-values of between 1.5 and 2 times higher than the corresponding for non-acid adapted control cells. This cross-protection response, which has important implications in food processing, was not dependent on the pH value and the acid used to acidify the growth medium. A membrane adaptation corresponding to an increase in the unsaturated to saturated fatty acids ratio (UFA/SFA) and membrane fluidity was observed at low growth temperature. Moreover, the acidification of the growth medium caused a decrease in UFA/SFA ratio and in the C18:1 relative concentration, and an increase in cyclopropane fatty acids (CFA) content mainly due to the increase in cyc19 relative concentration. Thus, acid adapted cells showed CFA levels 1.5 times higher than non-acid adapted control cells. A significant proportion of unsaturated fatty acids were converted to their cyclopropane derivatives during acid adaptation. These changes in membrane fatty acid composition result in cells with decreased membrane fluidity. A clear relation between membrane fatty acid composition and heat resistance was observed. In general, D-values were maximum for cells with low UFA/SFA ratio, and, consequently, with low membrane fluidity. Moreover, CFA formation played a major role in protecting acid adapted cells from heat inactivation. However, changes observed in membrane fatty acid composition are not enough to explain the great thermotolerance of cells grown at 45 [degree sign]C. Thus, other mechanisms, such as the synthesis of Heat Shock Proteins, could be responsible for this increase in the bacterial heat resistance.
Keywords: Salmonella typhimurium; Membrane fatty acids; Heat resistance; Acid adaptation; Food safety, Cross-protection

Anne Jensen, Line E. Thomsen, Rikke L. Jorgensen, Marianne H. Larsen, Bent B. Roldgaard, Bjarke B. Christensen, Birte F. Vogel, Lone Gram, Hanne Ingmer, Processing plant persistent strains of Listeria monocytogenes appear to have a lower virulence potential than clinical strains in selected virulence models, International Journal of Food Microbiology, Volume 123, Issue 3, 30 April 2008, Pages 254-261, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.02.016.
(http://www.sciencedirect.com/science/article/B6T7K-4RWH85V-3/2/1c70c6187814a3bdc795eb0999506f33)
Abstract:
Listeria monocytogenes is an important foodborne bacterial pathogen that can colonize food processing equipment. One group of genetically similar L. monocytogenes strains (RAPD type 9) was recently shown to reside in several independent fish processing plants. Persistent strains are likely to contaminate food products, and it is important to determine their virulence potential to evaluate risk to consumers. We compared the behaviour of food processing persistent and clinical L. monocytogenes strains in four virulence models: Adhesion, invasion and intracellular growth

was studied in an epithelial cell line, Caco-2; time to death in a nematode model, Caenorhabditis elegans and in a fruit fly model, Drosophila melanogaster and fecal shedding in a guinea pig model. All strains adhered to and grew in Caco-2 cells in similar levels. When exposed to 106 CFU/ml, two strains representing the persistent RAPD type 9 invaded Caco-2 cells in lower numbers (102-103 CFU/ml) as compared to the four other strains (104-106 CFU/ml), including food and human clinical strains. In the D. melanogaster model, the two RAPD type 9 strains were among the slowest to kill. Similarly, the time to reach 50% killed C. elegans worms was longer (110 h) for the RAPD type 9 strains than for the other four strains (80 h). The Scott A strain and one RAPD type 9 strain were suspended in whipping cream before being fed to guinea pigs and the persistent RAPD type 9 strain was isolated from feces in a lower level (approximately 102 CFU/g) than the Scott A strain (approximately 105 CFU/g) ($P < 0.05$). The addition of NaCl has been shown to cause autoaggregation and increases adhesion of L. monocytogenes to plastic. However, growth in the presence of NaCl did not alter the behaviour of the tested L. monocytogenes strains in the virulence models.
Overall, the two strains representing a very common fish processing plant persistent group (RAPD type 9) appear to have a lower virulence potential in all four virulence models than Scott A and a strain isolated from a clinical case of listeriosis.
Keywords: Listeria monocytogenes; Caco-2 cells; Drosophila melanogaster; Caenorhabditis elegans; Guinea pig; Persistence

Ana M. Herrero, Raman spectroscopy a promising technique for quality assessment of meat and fish: A review, Food Chemistry, Volume 107, Issue 4, 15 April 2008, Pages 1642-1651, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.10.014.
(http://www.sciencedirect.com/science/article/B6T6R-4PW05HN-3/2/446fb26c331a00625279538fae4a05ed)
Abstract:
Raman spectroscopy data have been compared to different traditional methodologies such as protein solubility, apparent viscosity, water holding capacity, instrumental texture methods, dimethylamine content, peroxide values, and fatty acid composition commonly used to determine quality in fish and meat muscle treated under different conditions of handling, processing and storage through the changes of proteins, water and lipids of muscle food. It has been shown that Raman spectroscopy data are related to the results obtained with these traditional quality methods and could be used to evaluate muscle food quality. In addition, Raman spectroscopy provides structural information about the changes of proteins, water and lipids of muscle food that occur during the deterioration. Raman spectroscopy can also be used for determining muscle food identification. Besides, this spectroscopy technique has several advantages compared to traditional methods since it is a direct and non-invasive technique which requires small portions of sample.
Keywords: Muscle food; Fish; Meat; Raman spectroscopy; Quality assessment; Authenticity

Rekha S. Singhal, John F. Kennedy, Sajilata M. Gopalakrishnan, Agnieszka Kaczmarek, Charles J. Knill, Putri Faridatul Akmar, Industrial production, processing, and utilization of sago palm-derived products, Carbohydrate Polymers, Volume 72, Issue 1, 3 April 2008, Pages 1-20, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.07.043.
(http://www.sciencedirect.com/science/article/B6TFD-4PG871N-2/2/fb4300e283489b8774a2eb3ee540e8f3)
Abstract:
With a deep concern over the probable global food shortage in the years to come, underutilized plant resources are now being extensively tapped by scientists throughout the world. In this regard, sago palm is gaining much importance as a crop par excellence and a starch crop of the 21st century, due to its being an extremely sustainable plant with an ability to thrive in most soil

conditions. The review focuses on sago palm as an invaluable resource of starchy foods and of innumerable other products of significant commercial value such as modified starches, lactic acid, cyclodextrins, and ethanol. Several important aspects of the properties and applications of sago palm-derived products that could be exploited commercially are also covered.
Keywords: Sago palm; Sago pith; Starch; Ethanol; Sugars; Lactic acid; Kojic acid; Cyclodextrin; Modified starch; Sap; Fronds; Hampas; Waste water

Silke Schiewer, Santosh B. Patil, Pectin-rich fruit wastes as biosorbents for heavy metal removal: Equilibrium and kinetics, Bioresource Technology, Volume 99, Issue 6, April 2008, Pages 1896-1903, ISSN 0960-8524, DOI: 10.1016/j.biortech.2007.03.060.
(http://www.sciencedirect.com/science/article/B6V24-4NVK1RT-3/2/1170d7d826917fff3273471821301939)
Abstract:
Biosorption can be used as a cost effective and efficient technique for the removal of toxic heavy metals from wastewater. Waste materials from industries such as food processing and agriculture may act as biosorbents. This study investigates the removal of cadmium by fruit wastes (derived from several citrus fruits, apples and grapes). Citrus peels were identified as the most promising biosorbent due to high metal uptake in conjunction with physical stability. Uptake was rapid with equilibrium reached after 30-80 min depending on the particle size (0.18-0.9 mm). Sorption kinetics followed a second-order model. Sorption equilibrium isotherms could be described by the Langmuir model in some cases, whereas in others an S-shaped isotherm was observed, that did not follow the Langmuir isotherm model. The metal uptake increased with pH, with uptake capacities ranging between 0.5 and 0.9 meq/g of dry peel. Due to their low cost, good uptake capacity, and rapid kinetics, citrus peels are a promising biosorbent material warranting further study.
Keywords: Biosorption; Heavy metals; Citrus peels; Kinetics; Langmuir isotherm

Kingsley K. Agyare, Youling L. Xiong, Kwaku Addo, Influence of salt and pH on the solubility and structural characteristics of transglutaminase-treated wheat gluten hydrolysate, Food Chemistry, Volume 107, Issue 3, 1 April 2008, Pages 1131-1137, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.09.039.
(http://www.sciencedirect.com/science/article/B6T6R-4PRYG84-3/2/781513deb3f9b591af28013717483bca)
Abstract:
Hydrolyzed wheat gluten (GH, 77-85% protein) was prepared by limited chymotrypsin digestion at 37 [degree sign]C for 4 h (degree of hydrolysis = 6.4%) and 15 h (degree of hydrolysis = 10.3%). Microbial transglutaminase (MTGase) treatment (55 [degree sign]C for 1 h, or 5 [degree sign]C for 18 h) effect on the solubility and structural characteristics of GH was examined under selected food processing conditions (pH 4.0-7.0, 0-0.6 M NaCl). The MTGase treatment increased solubility of GH by 3-29-fold ($P < 0.05$) within pH 4.0-7.0. Addition of 0.6 M NaCl or changing the conditions of MTGase incubation did not significantly alter solubility characteristics of GH. The MTGase treatment decreased surface hydrophobicity, and increased carboxyl groups in GH, suggesting cross-linking and deamidation. Fluorescence and UV spectra attributed the improved GH solubility to MTGase-induced polar environment, and partial masking of some nonpolar aromatic amino acids possibly due to high-molecular-weight polypeptides formed.
Keywords: Hydrolyzed wheat gluten; Structural properties; Solubility; Microbial transglutaminase

H.P. Vasantha Rupasinghe, Laixin Wang, Gwendolyn M. Huber, Nancy L. Pitts, Effect of baking on dietary fibre and phenolics of muffins incorporated with apple skin powder, Food Chemistry, Volume 107, Issue 3, 1 April 2008, Pages 1217-1224, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.09.057.

(http://www.sciencedirect.com/science/article/B6T6R-4PSK918-6/2/b2ede6ea0c9b30fe12f5ff70028f534a)
Abstract:
Apple fruit skin, a rich source of dietary fibre and phenolics, is a by-product of apple processing. The effect of baking on the dietary fibre, phenolics, and total antioxidant capacity was investigated using a model system of muffins incorporated with dried apple skin powder (ASP) as a value-added food ingredient. The blanched, dehydrated, and ground ASP contained approximately 41% total dietary fibre and oxygen radical absorption capacity (ORAC) of 52 mg Trolox equivalents g-1 dry weight. The total dietary fibre content, total phenolic content, and total antioxidant capacity of muffins were positively correlated to the amount of ASP incorporated into muffins. The mean percent recovery of quercetin glycosides, catechins, chlorogenic acid, phloridzin, and cyanidin galactoside after baking were 61%, 57%, 53%, 44%, and 20%.
Keywords: Malus domestica; Apple skin; Food ingredient; Dietary fibre; Polyphenolics; Antioxidant; Baking

Ans De Roeck, Daniel N. Sila, Thomas Duvetter, Ann Van Loey, Marc Hendrickx, Effect of high pressure/high temperature processing on cell wall pectic substances in relation to firmness of carrot tissue, Food Chemistry, Volume 107, Issue 3, 1 April 2008, Pages 1225-1235, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.09.076.
(http://www.sciencedirect.com/science/article/B6T6R-4PV2S4P-1/2/87f654a8348b34f546227a8f963fd356)
Abstract:
Thermal processing for food preservation results in undesired softening of fruits and vegetables. To explore the potential of high pressure sterilization in food processing, the effects of combined high pressure/high temperature (HP/HT) treatments on carrot pectic polysaccharides and the related textural properties were investigated and compared with that of samples thermally processed at atmospheric pressure. Disks of fresh carrot (Daucus carota var. Yukon) tissue were subjected to three different treatments (80 [degree sign]C-0.1 MPa, 100 [degree sign]C-0.1 MPa and 80 [degree sign]C-600 MPa) for varying time intervals. Subsequently, the residual texture and microstructural changes of the carrots were evaluated. Alcohol-insoluble residues were prepared from the samples and sequentially fractionated with water, cyclohexane-trans-1,2-diamine tetra-acetic acid (CDTA) and Na2CO3 solutions. Thermal treatments at 0.1 MPa caused extensive tissue softening. This was marked by increased cell separation, an increase in water soluble pectin (WSP) paralleled by a decrease in chelator (CSP) and sodium carbonate (NSP) soluble pectin. HP/HT treated carrots showed minimal softening and negligible changes in intercellular adhesion. This was accompanied by a significant reduction in the degree of methyl esterification of pectin, low WSP in contrast to the high CSP and NSP fractions, minor changes in the different pectin fractions during treatment, and a substantial amount of pectin in the fractionation residue. There was a clear difference between HP/HT and thermally processed carrot pectin; HP/HT showing pronounced texture preservation.
Keywords: Carrot; Pectin; Texture; Beta-elimination; High pressure sterilization

Yu-Ru Huang, Yen-Con Hung, Shun-Yao Hsu, Yao-Wen Huang, Deng-Fwu Hwang, Application of electrolyzed water in the food industry, Food Control, Volume 19, Issue 4, April 2008, Pages 329-345, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.08.012.
(http://www.sciencedirect.com/science/article/B6T6S-4PJ04VH-1/2/33e6d4efc2582b32c84ce105704a097a)
Abstract:
Electrolyzed oxidizing (EO) water has been regarded as a new sanitizer in recent years. Production of EO water needs only water and salt (sodium chloride). EO water have the following advantages over other traditional cleaning agents: effective disinfection, easy operation, relatively

inexpensive, and environmentally friendly. The main advantage of EO water is its safety. EO water which is also a strong acid, is different to hydrochloric acid or sulfuric acid in that it is not corrosive to skin, mucous membrane, or organic material. Electrolyzed water has been tested and used as a disinfectant in the food industry and other applications. Combination of EO water and other measures are also possible. This review includes a brief overview of issues related to the electrolyzed water and its effective cleaning of food surfaces in food processing plants and the cleaning of animal products and fresh produce.
Keywords: Electrolyzed water; Disinfectant; Food industry

Alex Patist, Darren Bates, Ultrasonic innovations in the food industry: From the laboratory to commercial production, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 147-154, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.07.004.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-4/2/7699aa7f85feacf5f0fabe72387e96ee)
Abstract:
High power ultrasound has only recently (< 5 years) become an efficient tool for large scale commercial applications, such as emulsification, homogenization, extraction, crystallization, dewatering, low temperature pasteurization, degassing, defoaming, activation and inactivation of enzymes, particle size reduction and viscosity alteration. This can be attributed to improved equipment design and higher efficiencies of large scale continuous flow-through systems. Like most innovative food processing technologies, high power ultrasonics is not an off-the-shelf technology and therefore needs to be developed and scaled up for each application. The objective of the present paper is to present examples of ultrasonic applications that have made it to commercialization and to share some key learnings involving scale up of an innovative food technology in general.Industrial relevance
Due to significant technical advances in the last 5 to 10 years, high power ultrasonics has become an alternative to many conventional food processing steps, such as homogenization, milling, high shear mixing, pasteurization and solid/liquid separation. Also, it has shown to improve the efficiency of traditional processes such as filtration/screening, extraction, crystallization and fermentation (i.e., as an add-on technology). The use of ultrasonics is often driven by economic benefits, yet in some cases a unique product functionality can be achieved. This manuscript presents several examples of commercial installations of this technology in the food industry and highlights some of the challenges in scale up and development.
Keywords: Ultrasonics; Ultrasound and process; Food process

Muthupandian Ashokkumar, Devi Sunartio, Sandra Kentish, Raymond Mawson, Lloyd Simons, Kamaljit Vilkhu, Cornelis (Kees) Versteeg, Modification of food ingredients by ultrasound to improve functionality: A preliminary study on a model system, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 155-160, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.05.005.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-3/2/67d3d470a07a45aff1572cd2f2543344)
Abstract:
The use of high-intensity ultrasound for food processing applications is being constantly explored. Extraction of gingerol from ginger, homogenisation of milk and generation of high quality emulsions from food ingredients are some examples where ultrasonication has been found to be efficient, at least in laboratory-scale trials. These ultrasonic processes primarily rely upon the physical effects of ultrasound. However, the potential restrictions and/or uses of the chemical effects generated by ultrasound-induced cavitation phenomena have often been overlooked. Our

investigation shows that unwanted reactions between ultrasonically generated radicals and food ingredients could be minimised by selecting lower ultrasonic frequencies for food processing. However, high frequency ultrasound could also be used for food processing, provided suitable radical scavengers are present in the solution. Preliminary results identified the potential of sonochemical hydroxylation of phenolic compounds as an efficient way of enhancing the antioxidant properties of certain food materials. Overall, these investigations have enabled the development of strategies for management of radical sonochemistry in food processing applications.Industrial relevance
The aim of this work is to identify the problems associated with the application of high power ultrasound in food processing in order to make ultrasonic food processing a safe, viable and innovative processing technology in food industry. Several food and chemical industries will be able to adopt sonochemical treatment to improve the quality and the productivity of specific products. As an adjunct to existing processing technologies the application of ultrasonics can reduce energy requirements and simplify formulation with less need to add ingredients as processing aids.
Keywords: Ultrasound; Sonochemistry; Hydroxylation; Antioxidants

Kamaljit Vilkhu, Raymond Mawson, Lloyd Simons, Darren Bates, Applications and opportunities for ultrasound assisted extraction in the food industry -- A review, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 161-169, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.014.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-7/2/b710c34f87fe53470073c501ba44c929)
Abstract:
Ultrasound assisted extraction (UAE) process enhancement for food and allied industries are reported in this review. This includes herbal, oil, protein and bioactives from plant and animal materials (e.g. polyphenolics, anthocyanins, aromatic compounds, polysaccharides and functional compounds) with increased yield of extracted components, increased rate of extraction, achieving reduction in extraction time and higher processing throughput. Ultrasound can enhance existing extraction processes and enable new commercial extraction opportunities and processes. New UAE processing approaches have been proposed, including, (a) the potential for modification of plant cell material to provide improved bioavailability of micro-nutrients while retaining the natural-like quality, (b) simultaneous extraction and encapsulation, (c) quenching of the radical sonochemistry especially in aqueous systems to avoid degradation of bioactives and (d) potential use of the radical sonochemistry to achieve targeted hydroxylation of polyphenolics and carotenoids to increase bioactivity.Industrial relevance
The application of ultrasonic assisted extraction (UAE) in food processing technology is of interest for enhancing extraction of components from plant and animal materials. This review shows that UAE technology can potentially enhance extraction of components such as polyphenolics, anthocyanins, aromatic compounds, polysaccharides, oils and functional compounds when used as a pre-treatment step in a unit process. The higher yield obtained in these UAE processes are of major interest from an industrial point of view, since the technology is an 'add on' step to the existing process with minimum alteration, application in aqueous extraction where organic solvents can be replaced with generally recognised as safe (GRAS) solvents, reduction in solvent usage, and shortening the extraction time. The use of ultrasonic for extraction purposes in high-cost raw materials is an economical alternative to traditional extraction processes, which is an industry demand for a sustainable development.
Keywords: Ultrasound assisted extraction; Cavitation; Particle size; Mass transfer

S. Kentish, T.J. Wooster, M. Ashokkumar, S. Balachandran, R. Mawson, L. Simons, The use of ultrasonics for nanoemulsion preparation, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 170-175, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.07.005.
(http://www.sciencedirect.com/science/article/B6W6D-4R06403-3/2/cf6ae00ebe17d1f644fa004c5ed541a0)
Abstract:
Oil-in-water emulsions are an important vehicles for the delivery of hydrophobic bioactive compounds into a range of food products. The preparation of very fine emulsions is of increasing interest to the beverage industry, as novel ingredients can be added with negligible impact to solution clarity. In the present study, both a batch and focused flow-through ultrasonic cell were utilized for emulsification with ultrasonic power generation at 20-24 kHz. Emulsions with a mean droplet size as low as 135 +/- 5 nm were achieved using a mixture of flaxseed oil and water in the presence of Tween 40 surfactant. Results are comparable to those for emulsions prepared with a microfluidizer operated at 100 MPa. The key to efficient ultrasonic emulsification is to determine an optimum ultrasonic energy intensity input for these systems, as excess energy input may lead to an increase in droplet size.Industrial relevance
The preparation of oil-in-water emulsions is a common feature of food processing operations. The use of ultrasound for this purpose can be competitive or even superior in terms of droplet size and energy efficiency when compared to classical rotor[soft hyphen]stator dispersion. It may also be more practicable with respect to production cost, equipment contamination and aseptic processing than a microfluidisation approach. The present paper shows that ultrasound can be effective in producing nanoemulsions for use in a range of food ingredients.
Keywords: Ultrasound; Emulsion; Triglyceride; Surfactant

Daniela Bermudez-Aguirre, Gustavo V. Barbosa-Canovas, Study of butter fat content in milk on the inactivation of Listeria innocua ATCC 51742 by thermo-sonication, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 176-185, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.07.008.
(http://www.sciencedirect.com/science/article/B6W6D-4R1MF3T-2/2/356b91896d2edc0745c1d0609752d095)
Abstract:
Ultrasound combined with heat treatment has yielded favorable results in the inactivation of microorganisms; however, the composition of food influences the rate of microbial inactivation. The objective of this research was to study the effect of butter fat content in milk on the inactivation of Listeria innocua and compositional parameters after thermo-sonication. Four butter fat contents in milk were evaluated at 63 [degree sign]C for 30 min of sonication (Hielscher(R) UP400S, 400 W, 24 kHz, 120 [mu]m amplitude). Results showed that inactivation of Listeria cells occurs first in fat free milk, and that the rate of inactivation decreases with increasing fat content. No degradation of protein content or color variation was observed after the treatments. The pH dropped to 6.22, and lactic acid content showed an increase of 0.015% after the treatment; solids-non-fat, density and freezing point decreased. During storage life, growth of mesophiles was retarded with sonication.Industrial relevance
Ultrasound is an emerging technology that has shown positive effects in milk processing. Listeria monocytogenes represent one of the main foodborne pathogenic microorganisms in the food industry. Results of this research show that thermo-sonication is a viable technology capable of inactivating Listeria cells in milk and extending shelf-life without significant nutritional or physicochemical changes.
Keywords: Listeria innocua; Thermo-sonication; Ultrasound; Milk; Butter fat content

Carla M. Wolbang, Jacqueline L. Fitos, Michael T. Treeby, The effect of high pressure processing on nutritional value and quality attributes of Cucumis melo L., Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 196-200, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.08.001.
(http://www.sciencedirect.com/science/article/B6W6D-4R06403-1/2/27549cb573c75597397733d540ba062c)
Abstract:
To determine the effect of cultivar on high pressure processing (HPP) performance three commercial melon varieties were assessed before and after HPP for vitamin C and [beta]-carotene by HPLC and for ferric ion reducing capacity (FIRC) using the Ferric Reducing Ability of Plasma (FRAP) assay. Total titrable acids (TTA), [degree sign]Brix and colour were also recorded for fresh,-HPP (material cut and packaged) and +HPP samples (material cut, packaged and subject to HPP). The HP process was non-thermal so as to determine the effect of pressure alone on these phytochemicals. There were significant differences between cultivars in vitamin C, [beta]-carotene, TTA, [degree sign]Brix and colour parameters in fresh samples prior to HPP. HPP did not have an effect on TTA or [degree sign]Brix, but colour was adversely affected. FIRC and vitamin C concentrations were decreased by HPP and these losses were cultivar dependent for vitamin C. Levels of [beta]-carotene were significantly increased. Cultivar was identified as an important parameter in raw material selection for HPP and retention of vitamin C as a good measure of both quality and cultivar suitability.Industrial relevance
There is an increasing consumer demand for fresh, natural and healthy fruit and vegetable products with an extended shelf life. This demand is driving industry to look at alternative preservation technologies. HPP has the potential to deliver safe, preserved fruit and vegetables through enzyme inactivation of microbe destruction. HPP removes the need for additives or preservatives and the process is therefore viewed as closer to 'natural' by consumers. We show that HPP results in minimal loss of sensorial properties and health-promoting phytochemicals; thus providing consumers a high quality, healthy product with extended shelf life. The introduction of non-thermal processing techniques has the potential to move the focus of the Australian food processing industry from safety to the dual aims of safety and health, resulting in an increase of health-promoting phytochemicals in highly consumed processed foods.
Keywords: High pressure processing; Melon (Cucumis melo L.); Cultivar; Vitamin C; [beta]-carotene; Ferric ion reducing capacity

Pankaj Maharjan, Brad W. Woonton, Louise E. Bennett, Geoffrey W. Smithers, Kirthi DeSilva, Milton T.W. Hearn, Novel chromatographic separation -- The potential of smart polymers, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 232-242, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.03.028.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-5/2/ac6cb4b8853a9fdbca9b59ef99bf0517)
Abstract:
`Smart' or stimuli-responsive polymers represent new classes of materials that are currently under development. These novel polymeric materials undergo conformational rearrangement in response to small changes in their environment, such as temperature, pH, UV irradiation, ionic strength or electric field. These environmental changes alter the structure of stimuli-responsive polymers and increase or decrease their overall hydrophobicity, resulting in reversible collapse, dehydration or hydrophobic layer formation. With further research into their synthesis, behaviour and application, these novel materials have great potential to become the `next generation' of separation media for cost-effective and environmentally-friendly extraction and purification of high value biomolecules from agri-food and other raw materials.Industrial relevance

The growing demand for functional food ingredients is requiring the development of selective, cost-effective isolation techniques. Chromatography is one technique employed to produce novel food ingredients. Chromatography procedures often require the use of large quantities of solvents, which must be removed from food products, increasing processing input costs (solvent and energy), and creating an environmental disposal issue. Smart polymers are novel materials that change phase with temperature or other types of operational conditions, and have the potential to offer a cost and environmentally attractive means of producing functional food ingredients. This paper presents a review of smart polymers as novel separation media, and their potential application in the food industry.
Keywords: Smart polymer; Temperature-responsive polymer; Poly(n-isopropylacrylamide); Bioseparation; Chromatography; Lower critical solution temperature; Affinity separation; Bioconjugates

Ryan Brady, Brad Woonton, Michelle L. Gee, Andrea J. O'Connor, Hierarchical mesoporous silica materials for separation of functional food ingredients -- A review, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 243-248, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.10.002.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-6/2/9b3fa40042ff6641214f3db599a6161d)
Abstract:
Recently developed mesoporous silica materials are proposed as adsorbents for the separation of food bioactive molecules, due to their narrow pore size distributions and high surface area. These materials can be synthesised with a variety of porous architectures with uniform pore sizes in the mesoporous range, making them attractive candidates for adsorption of biomacromolecules. Research on these materials to date has largely focused on their synthesis, characterisation and applications in catalysis. However, recent developments in the bioadsorption ability and capacity as well as the aqueous stability of mesoporous materials demonstrate their potential as adsorbents for separations in the food industry. This paper reviews the research in this area and identifies the challenges remaining for the application of these materials in food based separations.Industrial relevance
The increasing demand for health-promoting foods is a key driver for the development of highly selective, cost-effective separation technologies for food bioactive molecules. Separation and purification stages in industrial biotechnology processes can account for up to 70% of the capital and operating costs. A significant portion of the functional food market is devoted to dairy functional foods and ingredients, as milk and whey provide rich sources of bioactive proteins and peptides with a variety of biological and nutritional properties. Hence this paper focuses upon the potential for use of hierarchical mesoporous silica materials for separation of functional food ingredients, taking dairy streams as a representative example.
Keywords: Mesoporous silica; Adsorbents; Separations; Food processing

T.H. Tran, M.H. Nguyen, D. Zabaras, L.T.T. Vu, Process development of Gac powder by using different enzymes and drying techniques, Journal of Food Engineering, Volume 85, Issue 3, April 2008, Pages 359-365, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.07.029.
(http://www.sciencedirect.com/science/article/B6T8J-4PCXG89-3/2/b037040dca19f8a6282327d760de14ba)
Abstract:
New products from Gac, an indigenous fruit of Vietnam have been recently found in the worldwide markets as the aril part of the fruit has a high content of lycopene and [beta]-carotene. These carotenoids are currently in special demand as they are natural antioxidants with potential to prevent and treat cancers. This study investigated some processing approaches for the production

of powder from Gac arils and used currently developed analytical methods to measure the product qualities. The process development focused on the selection of a pre-treatment method before seed removal and a dehydration technique to minimise the degradation of the carotenoids after processing. The heat and enzymatic pre-treatments could be applied in an industrial-scale seed removal. However, using the same drying method the powder produced without enzymatic pre-treatment had a higher carotenoid content than the enzymatic-treated powder. Constant drying rates and critical moisture contents on a solid basis were measured for oven drying, air drying and vacuum drying. Spray drying and freeze drying were also attempted. Freeze-drying resulted in the Gac powder with the brightest colour and the highest level of carotenoids. The average loss of carotenoids of five Gac powder samples after pre-treatment and dehydration was 35%. These samples stored in vacuo below 25 [degree sign]C could retain the red colour and 70% of carotenoids after 4 months. They were found to be acceptable in some trial food products.
Keywords: Lycopene; [beta]-carotene; Carotenoid; Gac aril; Enzymatic pre-treatment; Constant drying rate; Critical moisture content

P. Coronel, J. Simunovic, K.P. Sandeep, G.D. Cartwright, P. Kumar, Sterilization solutions for aseptic processing using a continuous flow microwave system, Journal of Food Engineering, Volume 85, Issue 4, April 2008, Pages 528-536, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.08.016.
(http://www.sciencedirect.com/science/article/B6T8J-4PJCY5G-2/2/e86514c0adb12e8cdac7c261ceebe6ba)
Abstract:
The conventional method of sterilization of an aseptic processing system by recirculating hot water cannot be applied to a continuous flow microwave heating system. Therefore, a model solution with dielectric and flow properties similar to that of the food product is required as a sterilization solution. Dielectric properties of solutions of table salt, sugar, CMC, and mixtures of these solutes were measured and correlations for the dependence of dielectric properties on concentration of solute and temperature were developed. Sterilization solutions were prepared by matching the dielectric and rheological properties of solutions prepared from table salt, sugar, and CMC to those of the food product to be processed. Dielectric properties of milk and sweet potato puree were compared to those of salt-sugar-CMC mixtures and a model solution that closely matched the properties of each product was prepared and experimentally tested in a 5 kW continuous flow microwave system operating at 915 MHz. The temperature profile at the exit of the heating section during heating of the sterilization solution was compared to the temperature profile during heating of the product. It was observed that the temperatures during transition from sterilization solution to the product did not change appreciably. Thus, these model solutions can be used as sterilization solutions for aseptic processing using a continuous flow microwave system.
Keywords: Microwave heating; Aseptic processing; Dielectric properties; Sterilization solution

Sencer Buzrul, Hami Alpas, Alain Largeteau, Faruk Bozoglu, Gerard Demazeau, Compression heating of selected pressure transmitting fluids and liquid foods during high hydrostatic pressure treatment, Journal of Food Engineering, Volume 85, Issue 3, April 2008, Pages 466-472, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.08.014.
(http://www.sciencedirect.com/science/article/B6T8J-4PJ04P8-2/2/562c52f4d30cfe70ba1b812803f857b5)
Abstract:
Three pressure transmitting fluids (water, ethylene glycol, and ethanol) and three liquid foods (orange juice, whole, and skim milk) were pressurized at 100-400 MPa and at 5, 20 and 35 [degree sign]C, using different compression rates (100, 200, and 300 MPa/min) to evaluate the adiabatic heating phenomena during high hydrostatic pressure (HHP) processing. A pressure

vessel (3 L volume) in which liquid foods could be introduced directly was used to demonstrate the compression heating phenomena in large-scale commercial conditions.
The highest and second highest compression heating values were observed for ethanol and ethylene glycol, respectively. Orange juice, whole, and skim milk showed similar compression heating values with water. The results revealed that as the initial temperature of the samples increased, compression heating values also increased. In general, as the pressure level increased, the temperature increase per 100 MPa decreased only for ethanol and ethylene glycol. The compression rate also had an impact on the compression heating values of ethanol and ethylene glycol. However, water and liquid foods (that contained high amount of water) were not affected by the compression rate within the range studied (100-300 MPa/min).
An empirical response surface model was developed to calculate the temperature increase of the samples during HHP processing at different pressure levels and initial temperatures. In principle, the proposed model could also be used to predict the compression heating values of other foods under the combined effect of high pressure and temperature.
Keywords: High hydrostatic pressure; Compression heating; Pressure transmitting fluids; Response surface model

Wei Zhao, Ruijin Yang, Rongrong Lu, Mo Wang, Ping Qian, Wade Yang, Effect of PEF on microbial inactivation and physical-chemical properties of green tea extracts, LWT - Food Science and Technology, Volume 41, Issue 3, April 2008, Pages 425-431, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.03.020.
(http://www.sciencedirect.com/science/article/B6WMV-4NDDM7M-2/2/fef80ff00034e19bf37088175035a663)
Abstract:
The effects of pulsed electric fields (PEF) on (1) the inactivation of Escherichia coli and Staphylococus aureus in green tea beverage, and (2) the color, green tea polyphenols (GTP) content, and total free amino acids in green tea extracts were investigated. Green tea extract samples inoculated with E. coli and S. aureus were treated using a bench-scale PEF system at electric field strengths of 18.1, 27.4, and 38.4 kV/cm and total treatment times of 40, 80, 120, 160 and 200 [mu]s. The inactivation of E. coli and S. aureus by PEF treatment at 38.4 kV/cm for 160 and 200 [mu]s reached 5.6 and 4.9 log reductions, respectively. PEF processing caused no considerable changes in color, GTP and total free amino acids. The storage tests at 4 [degree sign]C showed that synergistic effect of low temperature storage and the antimicrobial functionality of GTP resulted in a considerable reduction in the microoganisms of the PEF-treated tea beverage, extending its shelf-life to over 6 months at 4 [degree sign]C.
Keywords: Pulsed electric fields (PEF); Green tea beverage; Tea polyphenols; Microbial inactivation; Food safety

P. Del Hoyo, M. Rendueles, M. Diaz, Effect of processing on functional properties of animal blood plasma, Meat Science, Volume 78, Issue 4, April 2008, Pages 522-528, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.07.024.
(http://www.sciencedirect.com/science/article/B6T9G-4P940TM-1/2/82c0f0cf97066b10b3b13cbd8b7cee3d)
Abstract:
A number of functional and physical properties such as solubility, foam capacity, emulsifying stability and interfacial tension were compared for standard plasma, plasma decationed by ion exchange and plasma deionized by ultrafiltration (UF). The changes in functional properties can determine the use of a protein as an additive to a food product or invalidate its use. All samples had good functional properties and hence could be used in the formulation of food products. Results showed that ion exchange and UF improved emulsifying capacity while having little effect on the other functional properties.

Keywords: Plasma proteins; Functional properties; Ion exchange; Ultrafiltration

An Tran-Duy, Johan W. Schrama, Anne A. van Dam, Johan A.J. Verreth, Effects of oxygen concentration and body weight on maximum feed intake, growth and hematological parameters of Nile tilapia, Oreochromis niloticus, Aquaculture, Volume 275, Issues 1-4, 31 March 2008, Pages 152-162, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2007.12.024.
(http://www.sciencedirect.com/science/article/B6T4D-4RH94RG-1/2/c54b841535daf76567ab91a7b9dd6114)
Abstract:
Feed intake and satiation in fish are regulated by a number of factors, of which dissolved oxygen concentration (DO) is important. Since fish take up oxygen through the limited gill surface area, all processes that need energy, including food processing, depend on their maximum oxygen uptake capacity. Maximum oxygen uptake capacity relative to body weight in bigger fish is smaller than in smaller fish because the gill surface area is allometrically related to body weight. In this study, effects of DO concentration and body weight on maximum feed intake, growth and hematological parameters of Nile tilapia (Oreochromis niloticus) were investigated. Two weight classes of fish (21 g and 147 g) were used. For each class, six tanks were employed of which half were exposed to one of two DO levels (about 3.0 mg/L and 5.6 mg/L). Fish were fed to apparent satiation twice per day with a commercial diet. The results showed that (1) feed intake and growth of the fish at high DO level were significantly higher than at low DO level ($P < 0.01$), (2) relative feed intake and growth of small fish were significantly higher than of big fish ($P < 0.001$), and (3) fish at low DO level made no hematological adjustments ($P >= 0.5$). Data suggest that (1) the limitation of the gill surface area results in lower feed intake and growth of fish at low DO concentration than at high DO concentration and (2) the allometric relationship between the gill surface area and body weight results in lower relative feed intake, which in turn results in lower relative growth in big fish than in small fish.
Keywords: Feed intake; Dissolved oxygen; Body size; Hematology; Tilapia; Oreochromis niloticus

Miren Castells, Sonia Marin, Vicente Sanchis, Antonio J. Ramos, Distribution of fumonisins and aflatoxins in corn fractions during industrial cornflake processing, International Journal of Food Microbiology, Volume 123, Issues 1-2, 31 March 2008, Pages 81-87, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.12.001.
(http://www.sciencedirect.com/science/article/B6T7K-4RDR16S-1/2/2f737718a3a8f0f2152b7a862e8d8f01)
Abstract:
The aim of this study was to investigate the distribution of fumonisins (B1 B2, and B3) and total aflatoxins (B1, B2, G1, and G2) in various corn processed fractions. 92 batches of whole corn and derived dry-milled fractions (animal feed flour, flaking grits, corn flour and corn meal) and cooked and roasted cornflakes fractions were industrially obtained. Samples were analyzed for both groups of mycotoxins by enzyme-linked immunosorbent assay (ELISA). Dry milling of corn led to a heterogeneous distribution of the two groups of mycotoxins in the different parts of the grain, with increased levels in fractions processed from outer layers (animal feed flour and corn flour) and decreased levels in fractions processed from inner portions, such as corn meal and flaking grits. Levels of fumonisins in cornflakes were lower than 400 [mu]g/kg, the maximum tolerable limit set by the EU. By contrast, three samples of final product were found to exceed the aflatoxin maximum tolerable limit of 4 [mu]g/kg. Animal feed flour showed concentration factors of 317 and 288% for fumonisins and aflatoxins, respectively. Food traceability system was used by the industrial companies which processed corn into breakfast cereals. Nevertheless, even though the use of food traceability, which is defined as the ability to trace any food, feed, food-producing animal or substance that will be used for consumption through all stages of production, processing

and distribution, only initial fumonisin contamination of whole corn and contamination of animal feed flour and corn flour were found to be correlated.
Keywords: Aflatoxins; Fumonisins; Corn; Cornflakes; Dry milling

A. Adriao, M. Vieira, I. Fernandes, M. Barbosa, M. Sol, R.P. Tenreiro, L. Chambel, B. Barata, I. Zilhao, G. Shama, S. Perni, S.J. Jordan, P.W. Andrew, M.L. Faleiro, Marked intra-strain variation in response of Listeria monocytogenes dairy isolates to acid or salt stress and the effect of acid or salt adaptation on adherence to abiotic surfaces, International Journal of Food Microbiology, Volume 123, Issues 1-2, 31 March 2008, Pages 142-150, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.12.016.
(http://www.sciencedirect.com/science/article/B6T7K-4RFSCPT-2/2/d6a2ea8bc3f3ad73f5adbcc63b147792)
Abstract:
During food processing, and particularly in cheese manufacturing processes, Listeria monocytogenes may be exposed routinely to environments of low pH or high salt concentration. It has been suggested that these environmental conditions may contribute to bacterial adherence to abiotic surfaces and increased resistance to disinfection. In this study strains isolated from the environment of artisanal cheese-making dairies were used to investigate the behaviour of L. monocytogenes in response to acid and salt stress and clear differences between strains was observed. In planktonic culture, strains varied in resistance to low pH or high NaCl concentration and in the occurrence of an adaptive response to moderate acid or NaCl. There was dislocation in responses to salt and acid. Strains resistant, or adaptive, to acid were not resistant or adaptive to NaCl. The reverse also was observed. Exposure to moderate acid did not promote adherence to polystyrene but survival, at low pH or high NaCl concentration, of cells adherent to stainless steel was increased, even for strains that had no adaptive response planktonically, but the detail of these observations varied between strains. In contrast to acid adaptation, with some strains salt adaptation enhanced adherence of L. monocytogenes to polystyrene but this was not true for all strains. For some strains salt- or acid adaptation may enhance the survival of sessile cells exposed to hypochlorite disinfection.
Keywords: Listeria monocytogenes; Acid; Salt; Adaptation; Adherence; Cheese

Dongyou Liu, Preparation of Listeria monocytogenes specimens for molecular detection and identification, International Journal of Food Microbiology, Volume 122, Issue 3, 20 March 2008, Pages 229-242, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.066.
(http://www.sciencedirect.com/science/article/B6T7K-4R8NB5F-3/2/ad86558de8e7ce1dcc41901bc2058c18)
Abstract:
Listeria monocytogenes is a common foodborne pathogen that has the capacity to cause severe clinical illness in vulnerable human population groups. The availability of rapid and specific laboratory tests to identify this bacterium is essential for preventing an otherwise easily treated malaise from developing into a life-threatening disease. To this end, a variety of rapid, sensitive and precise nucleic acid-based assays have been developed, contributing to the improved diagnosis of listeriosis. Nonetheless, since many molecular assays rely on enzymatic reaction for template amplification, which is liable to interference from inhibitory substances present in clinical, food and environmental specimens, they often require purified nucleic acids as starting material for test consistency. As a consequence, considerable efforts have been directed toward the development of innovative and efficient sample handling procedures that reduce and eliminate inhibitory elements present in the specimens. By reviewing the recent progresses in the sample preparation methods that have been described for enhanced molecular detection and identification of L. monocytogenes, including rapid procedures for cultured isolates, more elaborate techniques for processing clinical, food and environmental samples, and specific considerations in preparing

samples for quantitative PCR analysis, this article highlights further research requirement in the specimen processing protocols that form the basis for continued improvement in the overall performance of molecular assays for listeriosis.
Keywords: Listeria monocytogenes; Specimen preparation; Nucleic acid; Molecular detection; PCR

Iria Barcia, M. Luz Sanchez-Purrinos, Monica Novo, Ana Novas, Julio F. Maroto, Ramiro Barcia, Optimisation of Dosidicus gigas mantle proteolysis at industrial scale, Food Chemistry, Volume 107, Issue 2, 15 March 2008, Pages 869-875, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.09.026.
(http://www.sciencedirect.com/science/article/B6T6R-4PP77D8-2/2/f6a0fc35963fd4b12f58c8f09e8f1c34)
Abstract:
The use of enzymatic preparations in food processing is very old and has a number of advantages such as the high specificity of the enzymes, which avoids unwanted products, and their use at moderate temperatures, hence reducing alterations in the most labile components of food. The aim of this work is to supply information that would allow the use of Dosidicus gigas, as a source of raw material, in the preparation of diverse frozen products. With this purpose, we studied the effect of seven proteases: collagenase F, collagenase H, collagenase/dispase, papain, pronase, subtilisin and trypsin, and centered on the rheological and sensory evaluation of the changes which occurred in the texture of D. gigas, in order to establish the optimal conditions for the use of each enzyme.
Keywords: Dosidicus; Squid; Proteolysis; Sensory evaluation; Technological optimisation

Pham Van Hung, Tomoko Maeda, Di Miskelly, Rie Tsumori, Naofumi Morita, Physicochemical characteristics and fine structure of high-amylose wheat starches isolated from Australian wheat cultivars, Carbohydrate Polymers, Volume 71, Issue 4, 7 March 2008, Pages 656-663, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.07.015.
(http://www.sciencedirect.com/science/article/B6TFD-4P8SJ9S-1/2/a0ca5ab7e0697b7f447619a2508eb09e)
Abstract:
High-amylose starch is a source of resistant starch (RS) which have great impact on human health like dietary fiber. Nowadays, high-amylose wheat has been produced by genetic backcrossing, which enhances apparent amylose content and generates altered amylopectin. In this study, the high-amylose wheat starches isolated from various high-amylose wheat cultivars grown in Australia were characterized for understanding their physicochemical properties and fine structure of starch. The physicochemical characteristics of the high-amylose wheat starches are significantly different among the cultivars. Amylose contents of these cultivars were in a range of 28.0-36.9%, which is significantly higher than that of the normal wheat starch (25.6%). The high-amylose wheat starches also had higher blue value but lower [lambda]max than the normal wheat starch. Gelatinization temperature of the high-amylose wheat starches is higher than that of the normal wheat starch but transition enthalpy is lower. X-ray diffraction showed that the high-amylose wheat starch had C-type crystals close to A-type crystal. Pasting properties of the high-amylose wheat starches were varying depending on the cultivars. However, almost high-amylose wheat starches had lower peak and final viscosities and higher setback viscosity than did the normal wheat starch. Fine structure of amylose and amylopectin was different among the high-amylose wheat cultivars and related to the physicochemical properties of starch. These results help to understand well the characteristics of the high-amylose wheat starches before application for food processing.
Keywords: High-amylose wheat; Starch structure; Amylose content; Physicochemical property

D.O. Kennedy, C.F. Haskell, B. Robertson, J. Reay, C. Brewster-Maund, J. Luedemann, S. Maggini, M. Ruf, A. Zangara, A.B. Scholey, Improved cognitive performance and mental fatigue following a multi-vitamin and mineral supplement with added guarana (Paullinia cupana), Appetite, Volume 50, Issues 2-3, March-May 2008, Pages 506-513, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.10.007.
(http://www.sciencedirect.com/science/article/B6WB2-4R17TRM-2/2/5c9611b6edeff7a9db0afa893f9889c3)
Abstract:
Guarana (Paullinia cupana) extracts are most commonly used in Western markets as putatively psychoactive food and drink additives. This double-blind, randomised, placebo-controlled, parallel groups study assessed the acute effects of either a vitamin/mineral/guarana supplement or placebo drink in 129 healthy young adults (18-24 years). Participants completed a 10 min version of the Cognitive Demand Battery (comprising: Serial 3s and Serial 7s subtraction tasks, a Rapid Visual Information Processing (RVIP) task, `mental fatigue' scale). Thirty minutes following their drink participants made six consecutive completions of the battery (i.e. 60 min). The vitamin/mineral/guarana combination resulted in improved task performance, in comparison to placebo, in terms of both increased speed and accuracy of performing the RVIP task throughout the post-dose assessment. The increase in mental fatigue associated with extended task performance was also attenuated by the supplement.
This research supports previous findings demonstrating guarana's cognition enhancing properties and provides evidence that its addition to a multi-vitamin-mineral supplement can improve cognitive performance and reduce the mental fatigue associated with sustained mental effort.
Keywords: Vitamins; Minerals; Guarana; Paullinia cupana; Fatigue; Mental demand; Attention

P. Burton, The influence of food structure on glycaemic response: Modulation by storage and processing conditions and by food preparation, Appetite, Volume 50, Issues 2-3, March-May 2008, Page 556, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.09.021.
(http://www.sciencedirect.com/science/article/B6WB2-4RW4RRV-5/2/2fdb1e60cb97c7b2768369dc7d5684b1)
Abstract:
Ways of reducing the glycaemic index (GI) value of white bread, generally of high GI value, have important application for the food industry, with implications for diabetes, obesity and comorbidities, and cognitive functioning, acting via blood glucose stability. The current studies investigated the effects of: (i) decreasing bread volume, through manipulation of proving time and (ii) everyday food preparations, on glycaemic response to white bread. Eleven healthy subjects (4 male, 7 female; age 22-59 years; body mass index (BMI) <30 kg/m2) were recruited from Oxford Brookes University and the local community. Firstly, lowering loaf volume significantly reduced peak plasma glucose and GI values. Secondly, different storage and preparation conditions lowered the incremental area under the curve (IAUC) compared to fresh white homemade and commercial breads. These are the first studies known to the author to show reductions in glycaemic response through changes in physicochemical structure, brought about by reduced bread volume or processing and storage of white bread before consumption. This highlights an alternative approach to lowering dietary GI by changing the way we process white bread. Moreover, the findings highlight the need to define and maintain storage conditions of food products when GI values are determined.

Shawn R. Charlton, Edmund Fantino, Commodity specific rates of temporal discounting: Does metabolic function underlie differences in rates of discounting?, Behavioural Processes, Volume 77, Issue 3, March 2008, Pages 334-342, ISSN 0376-6357, DOI: 10.1016/j.beproc.2007.08.002.
(http://www.sciencedirect.com/science/article/B6T2J-4PJ6GHP-1/2/b46ddbbb286a7ad495a456dcb02cb68a)

Abstract:
Discounting rates vary as a function of commodity type. Previous studies suggest five potential characteristics of the commodity that could explain these differences: type of reinforcer (primary or secondary), if the commodity is perishable, if the commodity is satiable, if the commodity can be directly consumed, and immediacy of consumption. This paper suggests that these characteristics may best be viewed as related to a more fundamental characteristic: metabolic processing. In order to explore the possibility that metabolic processing underlies changes in discount rates, the difference in discounting between food, money, music CDs, DVDs, and books are compared. Music CDs, DVDs, and books share many characteristics in common with food, including gaining value through a physiological process, but are not directly metabolized. Results are consistent with previous findings of commodity specific discount rates and show that metabolic function plays a role in determining discount rates with those commodities that are metabolized being discounted at a higher rate. These results are interpreted as evidence that the discount rate for different commodities lies along a continuum with those that serve an exchange function rather than a direct function (money) anchoring the low end and those that serve a direct metabolic function capping the high end (food, alcohol, drugs).
Keywords: Discounting; Commodity; Consumption; Food; Money; Music; Self-control

E. Viola, F. Zimbardi, M. Cardinale, G. Cardinale, G. Braccio, E. Gambacorta, Processing cereal straws by steam explosion in a pilot plant to enhance digestibility in ruminants, Bioresource Technology, Volume 99, Issue 4, March 2008, Pages 681-689, ISSN 0960-8524, DOI: 10.1016/j.biortech.2007.02.001.
(http://www.sciencedirect.com/science/article/B6V24-4NBR8KT-3/2/031bdeb8be0f566744356eb8328fdf09)
Abstract:
Wheat, barley and oat straws were treated by steam explosion (SE) and then washed with 50 g/l NaOH solution. The SE treatment was optimized at batch scale on the basis of carbohydrate recovery. Stocks of fodder (300 kg) were produced at 198 [degree sign]C for 2.5 min by a continuous reactor and used for in vivo digestibility tests carried out on sheep. The flow-sheet and the mass balances were obtained for the entire process. For the three straws, the water consumption has been 7.3 kg/kg of straw. To delignify and improve the digestibility of the straws, 20 g of NaOH/kg straw was used. The yield of fodder, lignin and hemicellulose is dependant on the nature of the starting straw. Delignified fodder (insoluble fraction) can be produced with a yield of 0.64, 0.59, 0.55, respectively, from wheat, barley and oat straw. SE improved the digestibility of the straw by 25%; alkaline washing further increased it by 9%. Balanced rations containing, on a DM basis, 1/4 of treated straw, had digestibility coefficients similar to those of commercial rations based on alfalfa.
Keywords: Straw; Steam explosion; Digestibility; Fodder

Caroline Lejars, Pierre-Yves Le Gal, Sandrine Auzoux, A decision support approach for cane supply management within a sugar mill area, Computers and Electronics in Agriculture, Volume 60, Issue 2, March 2008, Pages 239-249, ISSN 0168-1699, DOI: 10.1016/j.compag.2007.08.008.
(http://www.sciencedirect.com/science/article/B6T5M-4R003DD-1/2/edc74195d8e54179eb988a16b94e1b10)
Abstract:
Increased competition between agri-food supply chains has strained relationships between farmers and processing factories while reducing individual profit margins. Decisions at different levels of the supply chain can no longer be considered independently, since they may influence profitability throughout the supply chain. This paper presents a decision support approach based on the MAGI(R) simulation tool, which aims to facilitate discussion and negotiation between stakeholders while collectively exploring satisfactory solutions.

The simulation tool helps sugarcane growers and millers in designing and assessing new ways of organizing cane supply management within a mill area. It addresses key issues such as restructuring mill areas or changing cane delivery allocation rules in order to increase total sugar production and total net revenue at the mill area level. This approach has been implemented for two mills in Reunion and one mill in South Africa. Simulations showed that sugar gains may be obtained by rearranging supply scheduling according to quality-based zoning within a mill area. Discussions led to further studies regarding the practicality of the best scenarios. MAGI(R) is now available as freeware for testing in different settings.
Keywords: Sugarcane; Supply chain; Modelling; Simulation tool; Participatory approach

Bozena Borycka, Jadwiga Stachowiak, Relations between cadmium and magnesium and aronia fractional dietary fibre, Food Chemistry, Volume 107, Issue 1, 1 March 2008, Pages 44-48, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.07.014.
(http://www.sciencedirect.com/science/article/B6T6R-4P6M66K-3/2/755ebcf3cbbf7fe63f21f253be11016d)
Abstract:
The aim of this investigation was to analyse the composition of dietary fibre from aronia pomace preparations and to evaluate its influence on cadmium and magnesium binding. The authors wanted also to estimate to what extent additional enzymatic processing could affect the sorption capacity of the aronia fibre.
Fibre preparations of aronia pomace possessed poor cadmium-binding capacity and desorbed magnesium, which is needed by the human body. There was a significant pH effect on cadmium and magnesium binding capacity. Magnesium desorption was much higher at pH 2.0 than at pH 6.0. The type of aronia sample did not generally affect the level of cadmium sorption.
Thus, aronia pomace preparations can be a source of dietary fibre and provide the body with magnesium. In addition, they can be used as weak cadmium sorbents.
Keywords: Aronia pomace; Dietary fibre; Metal-binding capacity; Cadmium sorption; Magnesium desorption; Food additives; Toxic metals

Sun Yan, Cai Huawei, Zheng Limin, Ren Fazheng, Zhang Luda, Zhang Hengtao, Development and characterization of a new amylase type time-temperature indicator, Food Control, Volume 19, Issue 3, March 2008, Pages 315-319, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.04.012.
(http://www.sciencedirect.com/science/article/B6T6S-4NMC87F-3/2/72134c7fd5870dc1bcaa0def6964947e)
Abstract:
Time-temperature indicators (TTIs) are effective on realization of cold chain throughout food processing and distribution. In this paper, a new amylase type TTI based on the reaction between amylase and starch was developed. Four amylase type TTIs were made in four different substrate concentrations. The mathematical models of each TTI were drawn up, which showed the relationships between the changes of indicator's color and time and temperature. The activation energies (Ea), which were 109.63, 114.59, 112.98 and 102.74 kJ/mol of each TTI, could be changed to match the Ea of food product, by modifying the proportion of the amylase and starch. The results present that this new amylase type TTI could be applied to show the time-temperature history of foodstuffs, and to indicate the food quality, which is associated with the undergoing of the time-temperature exposure.
Keywords: Amylase; Time-temperature indicators; Mathematical model

S. Dauphas, M. Amestoy, G. Llamas, M. Anton, A. Riaublanc, Modification of the interactions between [beta]-casein stabilised oil droplets with calcium addition and temperature changing, Food Hydrocolloids, Volume 22, Issue 2, March 2008, Pages 231-238, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.11.006.

(http://www.sciencedirect.com/science/article/B6VP9-4MV1P3F-1/2/571be9cd079f1fada008d2b2778cf84a)
Abstract:
Milk caseins are natural emulsifiers widely used in food processing applications. Four different caseins exist in milk. [beta]-casein, the more abundant, is present in solution in a molecular or aggregated state depending on concentration, temperature and calcium content. Varying these three parameters, four aggregation states of [beta]-casein were previously characterised: a molecular state at 4 [degree sign]C, a micellar state at 37 [degree sign]C, a 'polymeric' state at 4 [degree sign]C with calcium and an aggregated state at 37 [degree sign]C with calcium. In this paper, we have studied the influence of these [beta]-casein aggregation states on perikinetic flocculation of an oil-in-water emulsion, using rheological and microscopic tools. We have verified that in the absence of calcium, the molecular or micellar state of [beta]-casein in the aqueous phase did not lead to depletion flocculation in the condition used. In contrast, in the presence of calcium added after emulsification, the emulsions flocculated when the aggregated [beta]-casein were present in the aqueous phase. At low temperature, bridging flocculation of emulsions decreases when [beta]-casein concentration increases, but at higher temperature, we have observed the opposite behaviour. Moreover, this flocculation was totally reversible with temperature and calcium content. In fact, emulsions stabilised by [beta]-casein present a behaviour in term of aggregation close to that observed for [beta]-casein in solution with temperature and calcium changes. Hence, the aggregation state of non adsorbed [beta]-casein in the aqueous phase plays an important part in perikinetic emulsion flocculation.
Keywords: [beta]-casein structure; Non adsorbed proteins; Emulsion; Temperature; Calcium; Flocculation

Therese Sergent, Laurence Ribonnet, Anna Kolosova, Serge Garsou, Annelore Schaut, Sarah De Saeger, Carlos Van Peteghem, Yvan Larondelle, Luc Pussemier, Yves-Jacques Schneider, Molecular and cellular effects of food contaminants and secondary plant components and their plausible interactions at the intestinal level, Food and Chemical Toxicology, Volume 46, Issue 3, March 2008, Pages 813-841, ISSN 0278-6915, DOI: 10.1016/j.fct.2007.12.006.
(http://www.sciencedirect.com/science/article/B6T6P-4RBYG21-1/2/a0807181c1fbadf64b9dce0a63af5dff)
Abstract:
The intestinal mucosa is not simply a barrier allowing entry of compounds such as nutrients or chemicals, and restricting that of others. Intestinal cells and activities perform selective absorption, biotransformations and efflux back to the lumen. Furthermore, food substances affect both bioavailability and intestinal function. Some are able to act as transcriptional regulators and enzyme modulators.
This review points out plausible interactions between food contaminants and/or natural constituents at molecular and cellular levels and focuses on the effects of classical (pesticides and veterinary drugs), environmental (heavy metals, PCBs, dioxins, etc.) and food processing generated (PAHs, heterocyclic amines, etc.) contaminants on absorption, metabolism and efflux. Special attention is given to secondary metabolites of molds (mycotoxins) and plants (polyphenols). Molecular targets are briefly described as well as regulation mechanisms. Where possible, data referred to deal with human intestinal functions in vivo, and with in vitro studies on human intestinal Caco-2 cells; however, since data related to the intestine are rather scarce, effects on molecular targets in liver are also considered.
This review also points out the urgent need for fully validated high throughput in vitro tools to screen combinations of substances, at realistic intestinal concentrations. A higher priority could then be given to combinations of nutrients, xenobiotics and food contaminants, with hazardous or beneficial impacts on human health.

Keywords: Biotransformation; Efflux; Cytochrome P450; Food contaminants; Intestinal barrier; Intestinal interactions

Report of the EFSA GMO Panel Working Group on Animal Feeding Trials, Safety and nutritional assessment of GM plants and derived food and feed: The role of animal feeding trials, Food and Chemical Toxicology, Volume 46, Supplement 1, Safety and nutritional assessment of GM plants and derived food and feed: The role of animal feeding trials, March 2008, Pages S2-S70, ISSN 0278-6915, DOI: 10.1016/j.fct.2008.02.008.
(http://www.sciencedirect.com/science/article/B6T6P-4RTW3XD-1/2/250a51c65831407c5acec85a3c1945ce)
Abstract:
In this report the various elements of the safety and nutritional assessment procedure for genetically modified (GM) plant derived food and feed are discussed, in particular the potential and limitations of animal feeding trials for the safety and nutritional testing of whole GM food and feed. The general principles for the risk assessment of GM plants and derived food and feed are followed, as described in the EFSA guidance document of the EFSA Scientific Panel on Genetically Modified Organisms.
In Section 1 the mandate, scope and general principles for risk assessment of GM plant derived food and feed are discussed. Products under consideration are food and feed derived from GM plants, such as maize, soybeans, oilseed rape and cotton, modified through the introduction of one or more genes coding for agronomic input traits like herbicide tolerance and/or insect resistance. Furthermore GM plant derived food and feed, which have been obtained through extensive genetic modifications targeted at specific alterations of metabolic pathways leading to improved nutritional and/or health characteristics, such as rice containing [beta]-carotene, soybeans with enhanced oleic acid content, or tomato with increased concentration of flavonoids, are considered.
The safety assessment of GM plants and derived food and feed follows a comparative approach, i.e. the food and feed are compared with their non-GM counterparts in order to identify intended and unintended (unexpected) differences which subsequently are assessed with respect to their potential impact on the environment, safety for humans and animals, and nutritional quality. Key elements of the assessment procedure are the molecular, compositional, phenotypic and agronomic analysis in order to identify similarities and differences between the GM plant and its near isogenic counterpart.
The safety assessment is focussed on (i) the presence and characteristics of newly expressed proteins and other new constituents and possible changes in the level of natural constituents beyond normal variation, and on the characteristics of the GM food and feed, and (ii) the possible occurrence of unintended (unexpected) effects in GM plants due to genetic modification. In order to identify these effects a comparative phenotypic and molecular analysis of the GM plant and its near isogenic counterpart is carried out, in parallel with a targeted analysis of single specific compounds, which represent important metabolic pathways in the plant like macro and micro nutrients, known anti-nutrients and toxins. Significant differences may be indicative of the occurrence of unintended effects, which require further investigation.
Section 2 provides an overview of studies performed for the safety and nutritional assessment of whole food and feed. Extensive experience has been built up in recent decades from the safety and nutritional testing in animals of irradiated foods, novel foods and fruit and vegetables. These approaches are also relevant for the safety and nutritional testing of whole GM food and feed.
Many feeding trials have been reported in which GM foods like maize, potatoes, rice, soybeans and tomatoes have been fed to rats or mice for prolonged periods, and parameters such as body weight, feed consumption, blood chemistry, organ weights, histopathology etc have been measured. The food and feed under investigation were derived from GM plants with improved agronomic characteristics like herbicide tolerance and/or insect resistance. The majority of these experiments did not indicate clinical effects or histopathological abnormalities in organs or tissues

of exposed animals. In some cases adverse effects were noted, which were difficult to interpret due to shortcomings in the studies.
Many studies have also been carried out with feed derived from GM plants with agronomic input traits in target animal species to assess the nutritive value of the feed and their performance potential. Studies in sheep, pigs, broilers, lactating dairy cows, and fish, comparing the in vivo bioavailability of nutrients from a range of GM plants with their near isogenic counterpart and commercial varieties, showed that they were comparable with those for near isogenic non-GM lines and commercial varieties.
In Section 3 toxicological in vivo, in silico, and in vitro test methods are discussed which may be applied for the safety and nutritional assessment of specific compounds present in food and feed or of whole food and feed derived from GM plants. Moreover the purpose, potential and limitations of the 90-day rodent feeding trial for the safety and nutritional testing of whole food and feed have been examined.
Methods for single and repeated dose toxicity testing, reproductive and developmental toxicity testing and immunotoxicity testing, as described in OECD guideline tests for single well-defined chemicals are discussed and considered to be adequate for the safety testing of single substances including new products in GM food and feed.
Various in silico and in vitro methods may contribute to the safety assessment of GM plant derived food and feed and components thereof, like (i) in silico searches for sequence homology and/or structural similarity of novel proteins or their degradation products to known toxic or allergenic proteins, (ii) simulated gastric and intestinal fluids in order to study the digestive stability of newly expressed proteins and in vitro systems for analysis of the stability of the novel protein under heat or other processing conditions, and (iii) in vitro genotoxicity test methods that screen for point mutations, chromosomal aberrations and DNA damage/repair.
The current performance of the safety assessment of whole foods is mainly based on the protocols for low-molecular-weight chemicals such as pharmaceuticals, industrial chemicals, pesticides, food additives and contaminants. However without adaptation, these protocols have limitations for testing of whole food and feed. This primarily results from the fact that defined single substances can be dosed to laboratory animals at very large multiples of the expected human exposure, thus giving a large margin of safety. In contrast foodstuffs are bulky, lead to satiation and can only be included in the diet at much lower multiples of expected human intakes. When testing whole foods, the possible highest concentration of the GM food and feed in the laboratory animal diet may be limited because of nutritional imbalance of the diet, or by the presence of compounds with a known toxicological profile.
The aim of the 90-days rodent feeding study with the whole GM food and feed is to assess potential unintended effects of toxicological and/or nutritional relevance and to establish whether the GM food and feed is as safe and nutritious as its traditional comparator rather than determining qualitative and quantitative intrinsic toxicity of defined food constituents. The design of the study should be adapted from the OECD 90-day rodent toxicity study. The precise study design has to take into account the nature of the food and feed and the characteristics of the new trait(s) and their intended role in the GM food and feed.
A 90-day animal feeding trial has a large capacity (sensitivity and specificity) to detect potential toxicological effects of single well defined compounds. This can be concluded from data reported on the toxicology of a wide range of industrial chemicals, pharmaceuticals, food substances, environmental, and agricultural chemicals. It is possible to model the sensitivity of the rat subchronic feeding study for the detection of hypothetically increased amount of compounds such as anti-nutrients, toxicants or secondary metabolites. With respect to the detection of potential unintended effects in whole GM food and feed, it is unlikely that substances present in small amounts and with a low toxic potential will result in any observable (unintended) effects in a 90-day rodent feeding study, as they would be below the no-observed-effect-level and thus of unlikely impact to human health at normal intake levels.

Laboratory animal feeding studies of 90-days duration appear to be sufficient to pick up adverse effects of diverse compounds that would also give adverse effects after chronic exposure. This conclusion is based on literature data from studies investigating whether toxicological effects are adequately identified in 3-month subchronic studies in rodents, by comparing findings at 3 and 24 months for a range of different chemicals.

The 90-day rodent feeding study is not designed to detect effects on reproduction or development other than effects on adult reproductive organ weights and histopathology. Analyses of available data indicate that, for a wide range of substances, reproductive and developmental effects are not potentially more sensitive endpoints than those examined in subchronic toxicity tests. Should there be structural alerts for reproductive/developmental effects or other indications from data available on a GM food and feed, then these tests should be considered.

By relating the estimated daily intake, or theoretical maximum daily intake per capita for a given whole food (or the sum of its individual commercial constituents) to that consumed on average per rat per day in the subchronic 90-day feeding study, it is possible to establish the margin of exposure (safety margin) for consumers. Results obtained from testing GM food and feed in rodents indicate that large (at least 100-fold) `safety' margins exist between animal exposure levels without observed adverse effects and estimated human daily intake.

Results of feeding studies with feed derived from GM plants with improved agronomic properties, carried out in a wide range of livestock species, are discussed. The studies did not show any biologically relevant differences in the parameters tested between control and test animals. The studies have shown that targeted compositional analysis is the cornerstone for the safety assessment of GM plants modified for agronomic input traits, and once compositional equivalence has been established, feeding studies with livestock species add little to their safety assessment.

Examples of models for livestock feeding studies with GM plants with increased concentration of desirable nutrients are provided. Such studies should be conducted on a case-by-case basis to establish the nutritional benefits. Possible effects of the new feed resource on animal performance, animal health, efficacy, and acceptability of the new feed ingredient should be investigated, and time spans for such studies should be determined on a case-by-case basis.

The feasibility and limitations of human studies with foods derived from GM plants are discussed, as well as the potential and limitations of post-market monitoring to detect unintended effects of these foods. Post-market monitoring is not a substitute for a thorough pre-market risk assessment.

In Section 4 standards for test sample preparation, test materials, diet formulation and analysis are evaluated. Specific attention is paid to the choice of control diets and comparators, dietary stability, and nutritional balancing of diets.

When testing whole foods, it is desirable to obtain the highest concentration possible of the GM food and feed in the laboratory animal diet without causing nutritional imbalance. Normal practice is to use a minimum of two test dose levels and negative control with which to create nutritionally equivalent balanced diets in a comparative protocol.

It is recommended to include a relevant number of commercial varieties as control diets to demonstrate the biological range of the parameters which are measured in order to assess the biological relevance of statistically significant differences between the GM plant and its counterpart.

The choice of the comparator for GM food and feed testing is crucial, and can be found in the parental (near isogenic) line. For modified macronutrients a comparator is the unmodified form of the macronutrient. For investigating GM food and feed with enhanced nutritional properties, choices for control diets should be made on a case-by-case basis.

Section 5 provides information on the collection, analysis and interpretation of data and findings obtained from animal feeding studies.

Data generation for the prediction of safety and nutritional value of GM plant derived food and feed must be of high quality in order to perform a proper hazard identification and risk assessment. This

should be based on the use of standardised study designs conducted to the principles of Good Laboratory Practise, incorporating random quality assurance audits of all phases of the study.
Expert data evaluation and analysis are critical for establishing any association between exposure and outcome. This involves specialists from a broad range of scientific disciplines such as toxicologists, haematologists, clinical biochemists, pathologists, human and animal nutritionists and also biostatisticians.
One of the pivotal requirements in data analysis is to distinguish those effects which are potentially treatment related from spurious occurrences or the result of normal individual biological variation. If differences exist between test and control, comparison to historical control data from the same laboratory as well as published data for the strain, sex and age of the animal being investigated is helpful, as well as data obtained with commercial reference lines.
In Section 6 strategies are outlined for the safety and nutritional assessment of GM plant derived food and feed. The generation of studies for pre-market assessment of the safety and nutritional properties of food and feed from GM plants should follow a structured approach with stepwise development and consideration of the data obtained at each step in order to formulate the questions to be asked and answered at the next step (see Fig. 3).
Hazards related to the intended genetic modifications are evaluated applying in silico, in vitro and in vivo safety studies of newly expressed protein(s), newly formed metabolites, and of natural substances whose levels may have been altered as a result of gene insertion. Guidelines have been developed by OECD describing detailed protocols for the safety testing of these substances in food and feed. A detailed testing strategy should be designed based on the prior knowledge regarding the biology of these products, so that the relevant endpoints are measured in the individual test.
Testing of the safety and nutritional value of the whole GM plant or derived food and feed should be considered where the molecular, compositional, phenotypic, agronomic and other analyses have demonstrated differences between the GM plant derived food and feed and their conventional counterpart, apart from the inserted trait(s), or if there are any indications or remaining uncertainties for the potential occurrence of unintended effects. In such a case, the testing program should include at least a 90-day rodent feeding study.
In the context of the safety and nutritional assessment of GM plant derived food and feed, the adapted 90-day rodent feeding study, if triggered by the outcome of the molecular, compositional, phenotypic or agronomic analysis, functions as a sentinel study designed to assess potential unintended effects of toxicological and/or nutritional relevance rather than determining qualitative and quantitative intrinsic toxicity of defined food constituents.
In the situation where molecular, compositional, phenotypic, agronomic and other analyses have demonstrated equivalence between the GM plant derived food and feed and their near isogenic counterpart, except for the inserted trait(s), and do not indicate the occurrence of unintended effects, experiences with GM plants modified for agronomic input traits have demonstrated that the performance of 90-day feeding trials with rodents or feeding trials with target animal species have provided little if anything to the overall safety assessment (except for added confirmation of safety).
The use of 90-days studies in rodents should be considered for the detection of possible unintended effects in food and feed derived from GM plants which have been more extensively modified in order to cope with environmental stress conditions like drought or high salt conditions, or GM plants with quality or output traits with the purpose to improve human or animal nutrition and/or health.
Ninety-day studies with rodents are normally of sufficient duration for the identification of general toxicological effects of compounds that would also give adverse effects after chronic exposure. In general, long term, chronic toxicity testing of whole GM food and feed is not expected to generate information additional to what is already known from in silico/in vitro testing and from subchronic testing.

In cases where structural alerts or other information is available about the possibly altered occurrence of food components in the GM food and feed compared to its counterpart, the performance of specific toxicological testing, e.g. chronic, reproductive, etc., should be considered case-by-case, but preferentially only for the single substance of concern.
Livestock feeding studies with target animal species should be conducted on a case-by-case basis to establish the nutritional benefits that might be expected from GM plants with claimed nutritional/health benefits. Possible effects of the new feed resource on animal performance, animal health, efficacy, and acceptability of the new feed ingredient should be investigated, and time spans for such studies should be determined on a case-by-case basis.
There is a need for a more uniform approach to the design and analysis of animal feeding trials, and in particular for appropriate statistical analysis of data. The process of data interpretation requires extensive professional experience of the field, together with a thorough understanding of the concept of causality. One of the pivotal requirements is to distinguish those effects which are potentially treatment related from spurious occurrences or result from normal individual biological variation.
Post-market monitoring is not a substitute for a thorough pre-market risk assessment, neither should it be considered as a routine need. Knowledge gained through post-market monitoring might at best describe only broad patterns of human nutritional exposure. In general it cannot be relied upon as a technique for monitoring adverse events or other health outcomes related to the consumption of GM plant derived food and feed.
It can be anticipated that in the future the predictive value of a 90-day rodent feeding studies used for the safety assessment of whole food and feed will be enhanced by the integration of new technologies like transcriptomics, proteomics and metabolomics into the experimental risk assessment approach. Moreover, the use of `profiling' technologies may also facilitate a non-targeted approach in compositional analysis in order to aid the detection of unintended effects in GM plant derived food and feed due to the genetic modification. These technologies are still under development, and need validation before they can be used for routine safety assessment purposes.
In Section 7 conclusions and recommendations are presented on:
- The comparative approach to safety and nutritional testing of food and feed derived from GM plants.
- In silico and in vitro tools available for safety and nutritional testing of GM plant derived food and feed.
- Testing of defined single substances from GM plant derived food and feed in in vivo studies.
- Testing of whole GM plant derived food and feed in animal feeding studies.
- Importance of a structured approach for development of data for the pre-market safety and nutritional testing of GM plant derived food and feed.
- Role of post-market monitoring.
Keywords: EFSA; GM plants; GM food; GM feed; Whole foods; Animal feeding trials; Safety assessment; Nutritional assessment; Comparative approach

J. Huebner, R.L. Wehling, A. Parkhurst, R.W. Hutkins, Effect of processing conditions on the prebiotic activity of commercial prebiotics, International Dairy Journal, Volume 18, Issue 3, March 2008, Pages 287-293, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2007.08.013.
(http://www.sciencedirect.com/science/article/B6T7C-4PMT2TG-1/2/1d34f9a74d40aa977fe90a22c16fa399)
Abstract:
The functional prebiotic stability of fructooligosaccharides (FOS) and inulin was determined using a prebiotic activity assay. Prebiotic activity scores were determined based on the change in cell biomass of Lactobacillus paracasei 1195 on the prebiotic relative to that of Escherichia coli under equivalent conditions. Prebiotics were dissolved in citrate-phosphate buffer solutions (10% FOS or

2% inulin), and then exposed to each of three treatments simulating food processing conditions: low pH (pH 3-6), heat at low pH (30 min at 85 [degree sign]C, pH 4-7), and Maillard reaction conditions (up to 6 h at 85 [degree sign]C with 1% glycine, pH 7). Prebiotics were considered functionally stable if their score was unchanged after treatment. In general, only heating at low pH caused a significant reduction in prebiotic activity, with one of the FOS products being the least stable. The other conditions caused little change in activity. These results provide a basis for selecting prebiotics for use as functional food ingredients and for predicting the extent to which processing affects prebiotic activity.
Keywords: Fructooligosaccharides; Inulin; Prebiotics; Probiotics

F.K. Gates, B.J. Dobraszczyk, F.L. Stoddard, T. Sontag-Strohm, H. Salovaara, Interaction of heat-moisture conditions and physical properties in oat processing: I. Mechanical properties of steamed oat groats, Journal of Cereal Science, Volume 47, Issue 2, March 2008, Pages 239-244, ISSN 0733-5210, DOI: 10.1016/j.jcs.2007.04.003.
(http://www.sciencedirect.com/science/article/B6WHK-4NKJ0F6-1/2/3d2fab519ab7509e1a5a1695f9475562)
Abstract:
Research interest in oats has focussed on their nutritional value, but there have been few studies of their food processing. Heat treatment is characteristic of oat processing, as it is needed to inactivate lipase and to facilitate flaking. A Texture Analyser was used to characterise the mechanical properties of unkilned and kilned oat groats after steaming and tempering in an oven for 30, 60 and 90 min at 80, 95 and 110 [degree sign]C. Maximum force, number of peaks before maximum and final force after 5 s hold were used to characterise the behaviour of the groats during compression. Kilned groats were larger and softer before steaming. After steaming and tempering, the moisture content of the kilned groats was higher than for unkilned groats. Hot, steamed oats were softer than cold, unsteamed groats, indicated by a decrease in maximum force from 59 to 55 N, and there was no significant difference between kilned and unkilned groats. However, higher temperatures during tempering increased maximum force. These results suggest that mild steam treatment yields softer oat groats, whereas cold or over-treated groats tend to be harder.
Keywords: Heat treatment; Kilning; Strength

A. Bengtsson, A. Namutebi, M. Larsson Alminger, U. Svanberg, Effects of various traditional processing methods on the all-trans-[beta]-carotene content of orange-fleshed sweet potato, Journal of Food Composition and Analysis, Volume 21, Issue 2, March 2008, Pages 134-143, ISSN 0889-1575, DOI: 10.1016/j.jfca.2007.09.006.
(http://www.sciencedirect.com/science/article/B6WJH-4PSK8T2-1/2/024821c39823bf845e4131a3de3d0ca0)
Abstract:
The effects of traditional preparation methods and drying procedures on the provitamin A carotenoid content of orange-fleshed sweet potato (OFSP) roots was determined by a high-performance liquid chromatography (HPLC) method. All-trans-[beta]-carotene was the major provitamin A carotenoid and the mean content of seven improved OFSP cultivars ranged from 108 to 315 [mu]g/g dry matter. The retention of all-trans-[beta]-carotene was 78% when OFSP were boiled in water for 20 min. When OFSP were steamed for 30 min the retention was 77%, whereas deep-frying OFSP roots for 10 min resulted in retention levels of 78%. Drying slices of OFSP roots at 57 [degree sign]C in a forced-air oven for 10 h reduced the all-trans-[beta]-carotene content by 12%. Solar drying and open-air sun drying OFSP slices to a moisture content of [less-than-or-equals, slant]10% resulted in all-trans-[beta]-carotene losses of 9% and 16%, respectively. The cis-isomer 13-cis-[beta]-carotene was found in noticeable amounts in all processed samples, but not in any raw samples. The formation of 13-cis-[beta]-carotene correlated with the original amount

of all-trans-[beta]-carotene found in the raw OFSP root. The high content of all-trans-[beta]-carotene in the investigated improved OFSP varieties and the moderately low losses due to degradation and isomerization renders OFSP a suitable food source of provitamin A.
Keywords: Orange-fleshed sweet potato; Ipomoea batatas; [beta]-Carotene; Food processing; Drying; Retention; Vitamin A deficiency (VAD); Bio-fortified staple foods

Angelique Leonard, Silvia Blacher, Chatchai Nimmol, Sakamon Devahastin, Effect of far-infrared radiation assisted drying on microstructure of banana slices: An illustrative use of X-ray microtomography in microstructural evaluation of a food product, Journal of Food Engineering, Volume 85, Issue 1, March 2008, Pages 154-162, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.07.017.
(http://www.sciencedirect.com/science/article/B6T8J-4PBDPT2-3/2/acdb4e9ff9aa25c6d2f39079017dd8b0)
Abstract:
X-ray microtomography coupled with image analysis represents a non-destructive technique, which allows scanning an entire sample to obtain such information as total pore volume and pore size distribution without the need of serial cuts as in the case of scanning electron microscopy (SEM). The technique has been applied successfully to obtain reliable microstructural information of many products undergoing different physical and chemical processes. However, the technique has still found limited use in food processing. To illustrate the use of X-ray microtomography the technique was applied to investigate the effect of far-infrared radiation (FIR) assisted drying on microstructure of a food product viz. banana. Two representative drying techniques, i.e., low-pressure superheated steam drying (LPSSD) and vacuum drying (VACUUM) were tested. Banana slices were dried by LPSSD-FIR at two different temperatures (80 and 90 [degree sign]C) at a fixed pressure of 7 kPa. The total pore volume and pore size distribution of dried banana slices were then determined using X-ray microtomography. The results were also compared with those of products dried by LPSSD without FIR. Far-infrared radiation was found to modify the structure of the dried bananas by increasing their final porosity. The same effect of FIR was also observed in the case of vacuum drying with FIR (VACUUM-FIR). An increase of the drying temperature was also found to globally lead to an increase in the final porosity of the products.
Keywords: Image analysis; Low-pressure superheated steam drying; Microstructure; Porosity; X-ray microtomography; Vacuum drying

Lan T.T. Bui, Darryl M. Small, The impact of flours and product storage on the thiamin content of Asian noodles, LWT - Food Science and Technology, Volume 41, Issue 2, March 2008, Pages 262-269, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.03.001.
(http://www.sciencedirect.com/science/article/B6WMV-4N7S5B8-2/2/6a337259427c1de563d3ce192571945b)
Abstract:
Thiamin is essential for human health and wheat foods are generally considered to be a good source of thiamin. However, dietary levels may be limited because of losses during processing. The aim of this study was to investigate the level of thiamin in a variety of wheat flour products along with the factors impacting on the thiamin content of Asian noodles particularly during storage. A standard fluorometric procedure was selected for the determination of thiamin in flours and noodle samples. White salted, yellow alkaline and instant noodles were prepared and the impact of storage conditions on thiamin levels analysed. Noodle pH appeared to be directly related to the amount of alkaline salt added and this in turn influenced the thiamin stability. The losses varied between the different styles with the greatest decreases occurring in the fresh yellow alkaline noodles. Prolonged drying at 40 [degree sign]C for up to 9 days had no adverse influence on the ultimate thiamin status of these products. Storage of dried noodles for up to 4 months did not result in any further loss of thiamin. It is concluded that the potential of Asian noodles to

contribute to dietary thiamin intakes appears to be limited in those where alkaline salts are included in the formulation.
Keywords: Asian noodles; Nutrients; Thiamin

V.O. Adetunji, D.O. Alonge, R.K. Singh, J. Chen, Production of wara, a West African soft cheese using lemon juice as a coagulant, LWT - Food Science and Technology, Volume 41, Issue 2, March 2008, Pages 331-336, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.02.012.
(http://www.sciencedirect.com/science/article/B6WMV-4N66R5J-1/2/83d62526ca02bb029e239615f3a74680)
Abstract:
As an important protein source for West African consumers, wara cheese made from the leave extract of Calotropis procera has extremely short shelf life of only 2-3 days [Adegoke, G. O., Nse, E. N., & Akanni, A. O. (1992). Effects of heat, processing time, and pH on the microflora, aflatoxin content, and storability of wara, a soft white cheese. Die Nahrung, 36(3), 259-264; Umoh, V. J., & Solomon, O. (2001). Safety assessment and critical control point of milk product and some cereal beverages in Northern Nigeria. In: Proceedings of USDA/USAID/NIGERIA international conference on food safety and security, August 1-3 (pp. 122-127). Ibadan, Nigeria: IITA; Belewu, M. A., Belewu, K. Y., & Nkwunonwo, C.C. (2005). Effect of biological and chemical preservatives on the shelflife of West African soft cheese. African Journal of Biotechnology, 4, 1076-1079; Adetunji, A. O., Alonge, D. O., & Chen, J. (Unpublished). Microbial quality of wara, a southwestern Nigerian soft cheese]. Lemon juice was used in this study as a substitute coagulant during wara manufacture in order to improve the microbial quality of wara. The cheese was manufactured from pasteurized milk inoculated with 101 or 102 CFU ml-1 of Listeria monocytogenes. Samples of the milk or cheese were taken along the manufacturing steps and during a 5 d storage period at 15 and 28 [degree sign]C in order to determine the populations of L. monocytogenes, total aerobes, Enterobacteriaceae, and psychrotrophs, as well as mold and yeast. On the 4th day of storage, portions of the un-inoculated control cheese from 28 [degree sign]C were deep fried in vegetable oil, mimicking the practice of West African local cheese processors. The results showed that L. monocytogenes, at both inoculation levels, did not survive the manufacture of wara. In samples initially inoculated with 101 CFU ml-1 of L. monocytogenes, the Enterobacteriaceae counts decreased from the initial 1.78 to 1.00 Log10 CFU g-1 with the addition of lemon juice, and became undetectable (<1.00 Log10 CFU g-1) at the curdling point as well as during the 5 d storage period at both temperatures. The total aerobic counts increased from the undetectable level on the 1st day of storage to 7.65 and 3.39 Log10 CFU g-1, respectively at 28 or 15 [degree sign]C on the 5th day of storage. The psychrotrophic, as well as the yeast and mold counts increased from the undetectable levels on the 1st day of storage to 7.11 and 5.03 Log10 CFU g-1, respectively at 28 [degree sign]C. At 15 [degree sign]C however, the population of pyschrotrophs remained undetectable throughout the 5 d storage period whereas, the yeast and molds count increased to 3.08 Log10 CFU g-1 on day 3 before quickly decreasing to the undetectable levels on the 5th day of storage. A similar trend was observed in cheese made from the milk with an initial Listeria inoculation level of 102 CFU ml-1. The results of this study showed that lemon juice significantly reduced the populations of the sampled microorganisms, especially the populations of Enterobacteriaceae.
Keywords: Wara cheese; Lemon juice; Coagulant; Listeria monocytogenes; Spoilage microorganisms

Jin-song BAO, Accurate Measurement of Pasting Temperature by the Rapid Visco-Analyser: a Case Study Using Rice Flour, Rice Science, Volume 15, Issue 1, March 2008, Pages 69-72, ISSN 1672-6308, DOI: 10.1016/S1672-6308(08)60022-0.
(http://www.sciencedirect.com/science/article/B8JG8-4S7393J-C/2/26e3b481c1feb0838a1d846e33bc1c68)

Abstract:
Pasting properties are among the most important characteristics of starch, determining its applications in food processing and other industries. Pasting temperature derived from the Rapid Visco-analyser (RVA) (Newport Scientific), in most cases, is overestimated by the Thermocline for Windows software program. Here, two methods facilitating accurate measurement of pasting temperature by RVA were described. One is to change parameter setting to `screen' the true point where the pasting viscosity begins to increase, the other is to manually record the time (T1) when the pasting viscosity begins to increase and calculate the pasting temperature with the formula of (45/3.8)x(T1-1)+50 for rice flour. The latter method gave a manually determined pasting temperature which was significantly correlated with the gelatinization temperature measured by differential scanning calorimetry.
Keywords: rice; starch; gelatinization temperature; pasting temperature; methodology

A. Riba, S. Mokrane, F. Mathieu, A. Lebrihi, N. Sabaou, Mycoflora and ochratoxin A producing strains of Aspergillus in Algerian wheat, International Journal of Food Microbiology, Volume 122, Issues 1-2, 29 February 2008, Pages 85-92, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.057.
(http://www.sciencedirect.com/science/article/B6T7K-4R7NPVT-5/2/c60f54fe1744a8e7895456e947dfcf40)
Abstract:
Wheat is a basic staple food for very large segments of the population of Algeria. The aim of this study is to analyse ochratoxin A (OTA)-producing mould and OTA-contaminated wheat. To evaluate the mycoflora and the potential for OTA production by Aspergillus strains, a total of 85 samples of wheat destined for human consumption were collected from two regions in Algeria (Tizi Ouzou and Setif) during the following phases: preharvest, storage in silos, and after processing. The mean value counts of fungi ranged from 275 to 1277 CFU g- 1. The dominant genus was Aspergillus, predominantly A. flavus, A. niger and A. versicolor. The other isolated species were A. ochraceus, A. alliaceus, A. carbonarius, A. terreus, A. fumigatus, A. candidus and Aspergillus spp. The occurrence and the levels of the genus Penicillium, Fusarium, Alternaria and Mucor were substantially lower than those of Aspergillus. The storage in silos shows high levels of Aspergillus (66 to 84%), especially A. flavus, but A. niger and other fungi were isolated at relatively low percentages. Equal distribution of the fungal contamination into the bran, flour and semolina fractions was observed from Flour Mill and Semolina Mill. The genus Aspergillus remained present at high levels at several phases of the production process. In addition, the ability to produce OTA by 135 isolates belonging to eleven species of Aspergillus and 23 isolates of Penicillium spp. was analyzed using fluorescent detection-based HPLC. Thus, it was found that 51 isolates (32.3%) were ochratoxigenic. All isolated strains of A. ochraceus (12) and A. alliaceus (6) produced OTA at concentrations ranging from 0.23 to 11.50 [micro sign]g g- 1. Most of the A. carbonarius strains (80%) were OTA producers (0.01 to 9.35 [micro sign]g g- 1), whereas A. terreus (50%), A. niger (28%), A. fumigatus (40%), A. versicolor (18%) and Penicillium spp. (21.7%) were low level producers (0.01 to 0.07 [micro sign]g g- 1). The concentration of OTA was determined in 30 samples of wheat. OTA was detected in 12 (40%) of the samples at levels ranging from 0.21 to 41.55 [micro sign]g kg- 1.
Keywords: Wheat; Fungi; Aspergillus; Toxigenic; OTA; Algeria

Brian J. Duistermars, Mark A. Frye, Crossmodal Visual Input for Odor Tracking during Fly Flight, Current Biology, Volume 18, Issue 4, 26 February 2008, Pages 270-275, ISSN 0960-9822, DOI: 10.1016/j.cub.2008.01.027.
(http://www.sciencedirect.com/science/article/B6VRT-4RV1YYT-1/2/0eb3bc17545dca869456edb8e4588b3a)
Abstract: Summary

Flies generate robust and high-performance olfactory and visual behaviors. Adult fruit flies can distinguish small differences in odor concentration across antennae separated by less than 1 mm [1], and a single olfactory sensory neuron is sufficient for near-normal gradient tracking in larvae [2]. During flight a male housefly chasing a female executes a corrective turn within 40 ms after a course deviation by its target [3]. The challenges imposed by flying apparently benefit from the tight integration of unimodal sensory cues. Crossmodal interactions reduce the discrimination threshold for unimodal memory retrieval by enhancing stimulus salience [4], and dynamic crossmodal processing is required for odor search during free flight because animals fail to locate an odor source in the absence of rich visual feedback [5]. The visual requirements for odor localization are unknown. We tethered a hungry fly in a magnetic field, allowing it to yaw freely, presented odor plumes, and examined how visual cues influence odor tracking. We show that flies are unable to use a small-field object or landmark to assist plume tracking, whereas odor activates wide-field optomotor course control to enable accurate orientation toward an attractive food odor.
Keywords: SYSNEURO

Kaarina Aarnisalo, Elina Vihavainen, Leila Rantala, Riitta Maijala, Maija-Liisa Suihko, Sebastian Hielm, Pirkko Tuominen, Jukka Ranta, Laura Raaska, Use of results of microbiological analyses for risk-based control of Listeria monocytogenes in marinated broiler legs, International Journal of Food Microbiology, Volume 121, Issue 3, 10 February 2008, Pages 275-284, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.037.
(http://www.sciencedirect.com/science/article/B6T7K-4R53W3Y-2/2/b69084df350fe59aa76df28eb257412a)
Abstract:
Microbial risk assessment provides a means of estimating consumer risks associated with food products. The methods can also be applied at the plant level. In this study results of microbiological analyses were used to develop a robust single plant level risk assessment. Furthermore, the prevalence and numbers of Listeria monocytogenes in marinated broiler legs in Finland were estimated. These estimates were based on information on the prevalence, numbers and genotypes of L. monocytogenes in 186 marinated broiler legs from 41 retail stores. The products were from three main Finnish producers, which produce 90% of all marinated broiler legs sold in Finland. The prevalence and numbers of L. monocytogenes were estimated by Monte Carlo simulation using WinBUGS(R), but the model is applicable to any software featuring standard probability distributions. The estimated mean annual number of L. monocytogenes-positive broiler legs sold in Finland was 7.2 x 106 with a 95% credible interval (CI) 6.7 x 106-7.7 x 106. That would be 34% +/- 1% of the marinated broiler legs sold in Finland. The mean number of L. monocytogenes in marinated broiler legs estimated at the sell-by-date was 2 CFU/g, with a 95% CI of 0-14 CFU/g. Producer-specific L. monocytogenes strains were recovered from the products throughout the year, which emphasizes the importance of characterizing the isolates and identifying strains that may cause problems as part of risk assessment studies. As the levels of L. monocytogenes were low, the risk of acquiring listeriosis from these products proved to be insignificant. Consequently there was no need for a thorough national level risk assessment. However, an approach using worst-case and average point estimates was applied to produce an example of single producer level risk assessment based on limited data. This assessment also indicated that the risk from these products was low. The risk-based approach presented in this work can provide estimation of public health risk on which control measures at the plant level can be based.
Keywords: Risk assessment; Processing plants; Listeria monocytogenes; Broiler legs; Listeriosis

Leah Levanduski, Jacek Jaczynski, Increased resistance of Escherichia coli O157:H7 to electron beam following repetitive irradiation at sub-lethal doses, International Journal of Food

Microbiology, Volume 121, Issue 3, 10 February 2008, Pages 328-334, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.009.
(http://www.sciencedirect.com/science/article/B6T7K-4R4665C-3/2/85c9876220b6f4ae9ff4781c3ad67a0c)
Abstract:
One way that food processors in the United States have been controlling food-borne pathogens in a non-thermal manner is the application of electron beam (e-beam) radiation. The development of an increased resistance of Escherichia coli O157:H7 to various stressors such to pH, temperature, ionic strength, and antibiotics has been demonstrated. The objective of this study was to determine if the D10-value for E. coli O157:H7 (E. coli) in ground beef increases due to repetitive exposure to e-beam at sub-lethal levels. Ground beef samples were inoculated with E. coli and incubated to approximately 109 CFU/g followed by e-beam processing. Survivors were enumerated using a standard spread-plating technique. Colonies of E. coli survivors from the highest e-beam dose were isolated and grown for the next cycle of inoculation in ground beef and e-beam processing. Five such consecutive cycles of isolation and e-beam processing were performed. The D10-values for E. coli survivors following each cycle of e-beam processing were calculated from survivor curves. The D10-values increased ($P < 0.05$) with subsequent cycles of e-beam processing, starting at 0.24 +/- 0.03 kGy for E. coli ATCC strain 35150 and reaching 0.63 +/- 0.02 kGy for E. coli isolate L3. Following four cycles of e-beam processing, the isolate L3 increased ($P < 0.05$) its radio-resistance and survived an e-beam dose of 3.0 kGy. Therefore, our data demonstrates that e-beam can efficiently inactivate E. coli in food products; however, similar to other inactivation techniques, E. coli has a capability to develop increased resistance to e-beam if the same populations of E. coli in food products are repetitively subjected to e-beam processing. Although the exact mechanism for the development of increased radio-resistance of E. coli to e-beam is unclear at the moment, based on the available literature regarding increased resistance of E. coli to various stressors, it is likely that some genetic mechanism in involved. Therefore, we are currently investigating this hypothesis with micro-arrays.
Keywords: Escherichia coli O157:H7; Electron beam; Inactivation kinetics; D10-value; Non-thermal food preservation

Fernando Granado-Lorencio, Begona Olmedilla-Alonso, Carmen Herrero-Barbudo, Concepcion Sanchez-Moreno, Begona de Ancos, Jose Antonio Martinez, Belen Perez-Sacristan, Inmaculada Blanco-Navarro, Modified-atmosphere packaging (MAP) does not affect the bioavailability of tocopherols and carotenoids from broccoli in humans: A cross-over study, Food Chemistry, Volume 106, Issue 3, 1 February 2008, Pages 1070-1076, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.07.038.
(http://www.sciencedirect.com/science/article/B6T6R-4P8B11R-6/2/fe9fc11fd1b4e0ba9e376bb8225a9cde)
Abstract: Aim of the study
Ready-to-eat and pre-packed vegetables are increasingly accepted by consumers but little is known about the effect of these technological approaches on the bioavailability of the nutrients. To assess the effect of modified-atmosphere packaging (MAP) on the bioavailability in humans of carotenoids and tocopherols from broccoli.Results
Serum lutein increased significantly upon broccoli intake but those of [beta]-carotene, [alpha]- and [gamma]-tocopherol did not reach statistical significance. Serum changes were observed regardless of the type of broccoli consumed.Conclusions
Modified-atmosphere packaging does not affect significantly the in vivo bioavailability of carotenoids and tocopherols from broccoli, supporting its convenience for use by the food industry and consumers.
Keywords: Bioavailability; Food processing; Carotenoids; Vitamin E; Public health

Lazaro de la Torre-Gutierrez, Luis A. Chel-Guerrero, David Betancur-Ancona, Functional properties of square banana (Musa balbisiana) starch, Food Chemistry, Volume 106, Issue 3, 1 February 2008, Pages 1138-1144, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.07.044.
(http://www.sciencedirect.com/science/article/B6T6R-4P8B11R-C/2/3be5d00ce3943697291c23a8d9380c9b)
Abstract:
Starch was isolated from unripe square banana (Musa balbisiana) fruit and its functional properties were determined. Square banana starch peak gelatinisation temperature was 79.8 [degree sign]C and the transition enthalpy was 17.3 J/g. At 90 [degree sign]C, the solubility was 16.8%, the swelling power was 17.1 g water/g starch and the water absorption capacity was 14.3 g water/g starch. The paste properties were: temperature, 81 [degree sign]C; maximum viscosity, 326 BU; breakdown, 22 BU; setback, 40 BU and consistency, 18 BU. The clarity, expressed as transmittance, was 17.5%, and gel deformation was 32.4% with a 0.03 kgf maximum load. This starch had high syneresis and low stability in refrigeration and freezing cycles. Given its properties, square banana starch has potential applications in food systems requiring high temperature processing, such as jellies, sausages, bakery and canned products. It is inappropriate, however, for use in refrigerated or frozen foods.
Keywords: Banana; Musa balbisiana; Starch; Functional properties

B.B. Koubala, L.I. Mbome, G. Kansci, F. Tchouanguep Mbiapo, M.-J. Crepeau, J.-F. Thibault, M.-C. Ralet, Physicochemical properties of pectins from ambarella peels (Spondias cytherea) obtained using different extraction conditions, Food Chemistry, Volume 106, Issue 3, 1 February 2008, Pages 1202-1207, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.07.065.
(http://www.sciencedirect.com/science/article/B6T6R-4PB0PW9-5/2/b4e3fc9eb2c556af7d5a5788b16c329c)
Abstract:
Extraction and use of pectins from ambarella peels could add value to the waste products arising from processing of the fruit. Dried alcohol-insoluble residues (AIR) of ambarella peels were treated separately with HCl, deionised water and oxalic acid/ammonium oxalate solutions, and the resulting pectin extracts analysed for some biochemical and physicochemical parameters. The results show that pectin yield (9-30% dry AIR), uronic acid (557-727 mg/g dry weight), neutral sugars (125-158 mg/g), degree of methylation (50-58%) and acetylation (4-6%), molar mass (263,000-303,000 g/mol) and intrinsic viscosity (179-480 ml/g) varied significantly ($p < 0.05$) with the various extraction methods used. Extraction with oxalic acid/ammonium oxalate solution gave the highest pectin yield, with high molar mass and degree of methylation, making the extracts suitable for use as additives in the food industry. The results compared well to lime pectin extracted under the same conditions, indicating their commercial significance.
Keywords: Ambarella peels; Pectins; Physicochemical properties; Extraction conditions

A.J. Sanchez, W. Albarracin, R. Grau, C. Ricolfe, J.M. Barat, Control of ham salting by using image segmentation, Food Control, Volume 19, Issue 2, February 2008, Pages 135-142, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.02.012.
(http://www.sciencedirect.com/science/article/B6T6S-4N61FSJ-1/2/33e784ebe49f853fa1ad476dbd0fd342)
Abstract:
Curing is one of the most traditional processes in the meat industry, being used in a great variety of products such as cured ham. During the salting process the raw material acquires the curing agents, allowing the safe development of subsequent stages in processing.
Digital image analysis has been used in different food research areas. Most of the studies that use image analysis in the evaluation of different aspects of meat products have been carried out mainly on ham, detecting quality problems of the product. However, none of these studies deals

with the influence of different components present on the ham surface (fat, connective tissue and lean) and its relationship with mass transfer during ham processing.
The aim of this study was the use of image segmentation to quantify the lean, fatty and connective tissue areas on the ham surface and determine the relationship of those areas to salt gain during the salting process.
The obtained results show that image segmentation algorithm can be used in combination with other parameters values to predicting ham behaviour during the salting process.
Keywords: Image segmentation; Ham salting; Mass transfer areas

Clara Cortes, Maria J. Esteve, Ana Frigola, Color of orange juice treated by High Intensity Pulsed Electric Fields during refrigerated storage and comparison with pasteurized juice, Food Control, Volume 19, Issue 2, February 2008, Pages 151-158, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.03.001.
(http://www.sciencedirect.com/science/article/B6T6S-4N987YR-1/2/bf3f855e15253118d292fb5cf02e7b9b)
Abstract:
High Intensity Pulsed Electric Field (HIPEF) is one of the nonthermal minimal processing technologies interesting for scientists and food industry as a new, alternative (preservation) process for liquid food. We have evaluated the effect on color, browning and hydroxymethylfurfural (HMF) of a pasteurized orange juice and the same orange juice treated by HIPEF, during 7 weeks stored in refrigeration at 2 [degree sign]C and 10 [degree sign]C. Pasteurized orange juice presents greater yellow tendency (b*) and less red tendency (a*) than the untreated orange juice, while HIPEF orange juice presents a coloration more similar to the untreated orange juice. Color variations ([Delta]E) during storage are greater in orange juice pasteurized than in HIPEF treated orange juice. Non-thermal treated orange juice has less nonenzymatic browning than the pasteurized one. There is a significant increase in this parameter from the fourth week of storage in all the juices stored at 10 [degree sign]C, while in the ones stored at 2 [degree sign]C the browning index values are maintained during more time. There are no significant variations in the HMF content of the juices pasteurized or treated by HIPEF respect the untreated orange juice. During refrigerated storage, HMF is always below the maximum values established.
Keywords: Color; Browning; Furfural; Pulsed electric field; Storage

Maria Claudia D.P.B. Andre, Maria Raquel Hidalgo Campos, Liana Jayme Borges, Andre Kipnis, Fabiana Cristina Pimenta, Alvaro Bisol Serafini, Comparison of Staphylococcus aureus isolates from food handlers, raw bovine milk and Minas Frescal cheese by antibiogram and pulsed-field gel electrophoresis following SmaI digestion, Food Control, Volume 19, Issue 2, February 2008, Pages 200-207, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.03.010.
(http://www.sciencedirect.com/science/article/B6T6S-4ND60KB-3/2/a2041c6b3ef81bdb930e646623d5adbc)
Abstract:
During a year (from February/2004 to March/2005) 140 samples of food handlers (92), raw milk (24) and Minas Frescal cheese (24) were analyzed for the presence of Staphylococcus aureus in a dairy processing plant of Goias State, Brazil. Seventy-three S. aureus isolates were obtained and compared by antimicrobial susceptibility and by the DNA macrorestriction patterns obtained from pulsed-field gel electrophoresis following SmaI digestion in order to investigate the possible sources of cheeses contamination. The results showed high diversity among the strains, demonstrating a lack of predominance of an endemic clone in the dairy plant. Based on the results, the raw milk appears to be the most probable source of S. aureus contamination in cheeses.
Keywords: Staphylococcus aureus; Pulsotypes; Minas Frescal cheese

Oleksandr Tokarskyy, Douglas L. Marshall, Immunosensors for rapid detection of Escherichia coli O157:H7 -- Perspectives for use in the meat processing industry, Food Microbiology, Volume 25, Issue 1, February 2008, Pages 1-12, ISSN 0740-0020, DOI: 10.1016/j.fm.2007.07.005.
(http://www.sciencedirect.com/science/article/B6WFP-4P9SND6-1/2/49ed9c9b4b7a2c2d63c862a4a34ff2fd)
Abstract:
This review critically evaluates different types of immunosensors proposed for rapid identification of Escherichia coli O157:H7. The methods are compared with approved USDA-FSIS standard procedures for determination of this pathogen in raw or ready-to-eat meat products. Major advantages and disadvantages for each method are highlighted. Our analysis suggests that application of immunosensors in the meat-processing industry may be limited to identification of uncontaminated samples after conventional selective enrichment in broth. Use for detection appears limited at the present time.
Keywords: Escherichia coli O157:H7; Immunosensors; Food safety

B.S.M. Mahmoud, R.H. Linton, Inactivation kinetics of inoculated Escherichia coli O157:H7 and Salmonella enterica on lettuce by chlorine dioxide gas, Food Microbiology, Volume 25, Issue 2, February 2008, Pages 244-252, ISSN 0740-0020, DOI: 10.1016/j.fm.2007.10.015.
(http://www.sciencedirect.com/science/article/B6WFP-4R5F1TB-1/2/85bda71314fc01c26acff114f689b222)
Abstract:
The purpose of this investigation was to study inactivation kinetics of inoculated Escherichia coli O157:H7 and Salmonella enterica on lettuce leaves by ClO2 gas at different concentrations (0.5, 1.0, 1.5, 3.0, and 5.0 mg l-1) for 10 min and to determine the effect of ClO2 gas on the quality and shelf life of lettuce during storage at 4 [degree sign]C for 7 days. One hundred microliters of each targeted organism was separately spot-inoculated onto the surface (5 cm2) of lettuce (approximately 8-9 log CFU ml-1), air-dried, and treated with ClO2 gas at 22 [degree sign]C and 90-95% relative humidity for 10 min. Surviving bacterial populations on lettuce were determined using a membrane transferring method, which included a non-selective medium followed by a selective medium. The inactivation kinetics of E. coli O157:H7 and S. enterica was determined using first-order kinetics to establish D-values and z-values. The D-values of E. coli and S. enterica were 2.9+/-0.1 and 3.8+/-0.5 min, respectively, at 5.0 mg l-1 ClO2 gas. The z-values of E. coli and S. enterica were 16.2+/-2.4 and 21.4+/-0.5 mg l-1, respectively. A 5 log CFU reduction (recommended by the United States Food and Drug Administration) for E. coli and S. enterica could be achieved with 5.0 mg l-1 ClO2 gas for 14.5 and 19.0 min, respectively. Treatment with ClO2 gas significantly reduced inherent microflora on lettuce and microbial counts remained significantly ($p<0.05$) lower than the uninoculated control during storage at 4 [degree sign]C for 7 days. However, treatment with ClO2 gas had a significantly ($p<0.05$) negative impact on visual leaf quality. These results showed that treatment with ClO2 gas significantly reduced selected pathogens and inherent microorganisms on lettuce; however, the processing conditions would likely need to be altered for consumer acceptance.
Keywords: Chlorine dioxide (ClO2) gas; E. coli O157:H7; Inactivation kinetics; Lettuce; Quality; Salmonella enterica; Shelf life

Antonia S. Gounadaki, Panagiotis N. Skandamis, Eleftherios H. Drosinos, George-John E. Nychas, Microbial ecology of food contact surfaces and products of small-scale facilities producing traditional sausages, Food Microbiology, Volume 25, Issue 2, February 2008, Pages 313-323, ISSN 0740-0020, DOI: 10.1016/j.fm.2007.10.001.
(http://www.sciencedirect.com/science/article/B6WFP-4PV2RX7-2/2/6fb476c26f1f31380e73a6630b74d1cd)
Abstract:

The microbial status in 7 small-scale facilities (SSFs) producing traditional fermented and/or dry sausages was investigated. It was shown that the hygienic status of the processing environment and equipment plays an essential role in the microbial stability and safety of the final products. The current study revealed that the majority of the sampling sites (control points) tested were highly (>4 log CFU/cm2) contaminated by spoilage flora (i.e. Pseudomonas, Enterobacteriaceae), with knives, tables and mincing machines being the most heavily contaminated surfaces. Moreover, Listeria monocytogenes, Salmonella spp. and Staphylococus aureus were detected in 11.7%, 26.4%, and 11.7% of the food contact surfaces, respectively. The presence of these pathogens seemed to be associated with high numbers of one or more specific groups of the `house-flora' on the sampling sites of the facilities; however, high numbers of `house-flora' do not always suggest the presence of pathogens. With regard to product samples, batter samples were heavily contaminated with the `house-flora' present on surfaces and equipment of the processing facilities while by the end of processing (final products) LAB constituted the predominant microbial flora of all products. The low initial levels of S. aureus and Salmonella found in batter samples as well as the combination of hurdles (mainly aw<0.92, average pH ca. <5.0 and competitive effect of natural flora) in the final products were able to inhibit and/or eliminate these pathogens; however, the detection of L. monocytogenes in 3 out of the 7 final products examined is indicative of cross-contamination. Our findings further indicate that inadequate hygiene practices within small-scale-processing facilities may result in loss of microbial control. Therefore, this study addresses the need for strict control measures within SSFs producing traditional fermented sausages.
Keywords: Microbial ecology; Hygiene practices; Safety control; Traditional sausages

Ana M. Diez, Eva M. Santos, Isabel Jaime, Jordi Rovira, Application of organic acid salts and high-pressure treatments to improve the preservation of blood sausage, Food Microbiology, Volume 25, Issue 1, February 2008, Pages 154-161, ISSN 0740-0020, DOI: 10.1016/j.fm.2007.06.004.
(http://www.sciencedirect.com/science/article/B6WFP-4P4FV43-2/2/200c5a9db0b799178fbc59db36df4ea4)
Abstract:
Blood sausages are traditional products in many parts of the world. In most cases, a very short shelf-life limits their consumption to the areas in which they are produced. In this work, different mild preservation methods were applied to Morcilla de Burgos, a Spanish blood sausage, consisting of a range of organic acid salts (OAS) and high-pressure processing (HPP), with the aim of increasing its shelf-life. In the first experiment, three batches of morcillas were produced using three different commercial OAS-PL (3% potassium lactate), PL+SL (3% potassium and sodium lactate) and PL+SD (2.5% potassium lactate and sodium diacetate)--together with a control batch and were stored under chill conditions (4 [degree sign]C) for 35 days. In a further experiment, vacuum-packaged morcillas were treated at three different pressure levels--300, 500 and 600 MPa--for 10 min, and stored under chill conditions for 28 days. In both batches, a sensory difference test was performed on day 1 after treatment and the morcilla samples were subjected to microbiological and sensory analysis after each week in storage. The results suggest that, in both cases, an addition of PL+SL and the application of 600 MPa for 10 min increases the shelf-life of the morcillas by 15 days. Once again, it is evident that the initial opportunities for contamination play a very important role in improving the shelf-life of food products.
Keywords: Blood sausage; Lactic acid bacteria; Spoilage; Organic acids; HPP; Meat products

E.O. Sunny-Roberts, D. Knorr, Evaluation of the response of Lactobacillus rhamnosus VTT E-97800 to sucrose-induced osmotic stress, Food Microbiology, Volume 25, Issue 1, February 2008, Pages 183-189, ISSN 0740-0020, DOI: 10.1016/j.fm.2007.05.003.
(http://www.sciencedirect.com/science/article/B6WFP-4NWNCR2-1/2/c5818887f4171f544cbd75f8234c5c5d)
Abstract:

Environmental osmotic changes are one of the stresses live probiotics may encounter either in their natural habitats or as a result of usage in food formulations and processing. Response to osmotic stress, induced by sucrose, of the probiotic strain Lactobacillus rhamnosus VTT E-97800 (E800) was investigated. The fluorescence-based approach used, by combined staining with caboxyfluorescein (cFDA) and propidium iodide (PI) could give insights on the osmotic-induced changes of microbial esterase activity and membrane integrity; also the extrusion of intracellular accumulated carboxyfluorescein (cF) upon energizing with glucose. Comparison of the flowcytometric viability assessment with the conventional culture techniques revealed that sucrose-stressed cells had a slight loss of culturability (log N/N0~-0.3) at 1.2 and 1.5 M sucrose concentration though they could perform an enzymatic conversion of cFDA into cF. The presence of such metabolically active bacteria in food might be critical as they may excrete toxic or food spoilage metabolites. Moreover, the perturbation of cF extrusion activities became a limiting factor for reproductive capacities. There was no change in the cell morphology. These results proved the ability of the strain of study to tolerate sucrose, even at extreme concentrations and these must be taken into consideration for its usage in the formulation/processing of sugar-based foods, e.g. jams, candies, etc.
Keywords: Lactobacillus rhamnosus E800; Sucrose; Viability; Flow-cytometry; Stress response

Kornelius Kupczik, M. Christopher Dean, Comparative observations on the tooth root morphology of Gigantopithecus blacki, Journal of Human Evolution, Volume 54, Issue 2, Dental Tissue Studies: 2D and 3D Insights into Human Evolution, February 2008, Pages 196-204, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2007.09.013.
(http://www.sciencedirect.com/science/article/B6WJS-4R7CYKN-2/2/e7a1d54287ff207bdd578331d8150851)
Abstract:
The extinct great ape Gigantopithecus blacki from the middle Pleistocene of China and Vietnam is known only from dental and mandibular remains, and its dietary specializations remain contentious. Here, for the first time, we describe the root morphology in G. blacki using computed tomography and three-dimensional image processing. We quantify the tooth root lengths and surface areas of the female G. blacki mandible No. 1 from the Liucheng Cave and compare it to a sample of extant great apes and humans, as well as the giant panda (Ailuropoda melanoleuca) and the American black bear (Ursus americanus). The results show that, in G. blacki, the pattern of mandibular root numbers--particularly that of the premolars--corresponds with that of Gorilla gorilla, Pan troglodytes, and Pongo pygmaeus. However, G. blacki can be distinguished from the extant hominids by having relatively higher values for postcanine root length and surface area, both absolutely and relative to mandibular size (except for premolar root lengths of humans). The relatively large postcanine root surface areas, which are most similar to A. melanoleuca, suggest that the dentition of G. blacki was adapted to sustaining relatively large occlusal forces needed to fracture mechanically resistant foods such as bamboo.
Keywords: Asian fossil ape; Computed tomography; Dental morphology; Mastication; Tooth roots

Martin Scanlon, P. Richardson, Editor, Improving the thermal processing of foods, CRC Press, Boca Raton, FL, USA (2004) 507 Pages, Price $289.95., Trends in Food Science & Technology, Volume 19, Issue 2, February 2008, Pages 115-116, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.10.005.
(http://www.sciencedirect.com/science/article/B6VHY-4R29609-1/2/1ff532f18aaa8be20f1fa2341339e46a)

Loong-Tak Lim, Packaging for Nonthermal Processing of Food, edited by Jung H. Han, Published by: Blackwell Publishing, ISBN: 978-0-8138-1944-0., Trends in Food Science & Technology,

Volume 19, Issue 2, February 2008, Pages 117-118, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.11.003.
(http://www.sciencedirect.com/science/article/B6VHY-4R41K1V-1/2/3a66fd45fd2cfca5af2f8b5e85defbfb)

Niels Skovgaard, Packaging for Nonthermal Processing of Food, Jung H. Han (ed.), Blackwell Publishing, IFT Press, UK,2007, xii+ 235 pages, hardback UK [pound sign]85; ISBN 9780813819440. www.blackwellprofessional.com., International Journal of Food Microbiology, Volume 121, Issue 2, 31 January 2008, Page 243, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.032.
(http://www.sciencedirect.com/science/article/B6T7K-4R53SSR-4/2/2902616b51b95e9ffdb1f468b31ba11f)

M.B. Lynch, J.J. Callan, J.V. O'Doherty, The interaction between lactose level and enzyme supplementation and form of barley processing on performance, digestibility and faecal volatile fatty acid concentration of weanling pigs fed barley-based diets, Animal Feed Science and Technology, Volume 140, Issues 3-4, 15 January 2008, Pages 349-364, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2007.03.008.
(http://www.sciencedirect.com/science/article/B6T42-4NMCV60-1/2/0e48633e035cb2fc9c0822b9402e7500)
Abstract:
A 2x3 factorial arrangement was used to investigate the interaction between lactose level (170 g/kg versus 275 g/kg), enzyme supplementation (with or without endo-1,3 (4)-[beta]-glucanase) and toasting (raw barley versus toasted barley) in barley-based diets (250 g/kg) on piglet performance and diet digestibility postweaning. One hundred and forty-four weaned piglets (24 days old, 6.5 kg live weight) were blocked on the basis of live weight and were assigned to one of six dietary treatments (n = 6) for 21 days as follows: (1) 170 g lactose/kg and barley (250 g/kg), (2) 275 g lactose/kg and barley (250 g/kg), (3) 170 g lactose/kg and toasted-flaked barley (250 g/kg), (4) 275 g lactose/kg and toasted-flaked barley (250 g/kg), (5) 170 g lactose/kg and barley (250 g/kg) plus [beta]-glucanase, (6) 275 g lactose/kg and barley (250 g/kg) plus [beta]-glucanase. There was an interaction (P<0.05) between lactose level and [beta]-glucanase supplementation on average daily gain (ADG), food conversion ratio (FCR) and coefficient of total tract apparent digestibilities (CTTAD) of dry matter (DMD), organic matter (OMD) and nitrogen (N). Pigs offered 170 g lactose/kg and [beta]-glucanase supplementation had an improved FCR and ADG compared to the treatment based on 170 g lactose/kg and unsupplemented barley. However, [beta]-glucanase supplementation at 275 g lactose/kg had no significant effect on FCR and ADG compared to the 275 g lactose/kg and unsupplemented barley. Pigs offered diets containing 170 g lactose/kg plus [beta]-glucanase had a significantly higher CTTAD for DMD, OMD and nitrogen compared to the 275 g lactose/kg plus [beta]-glucanase diet. However, there was no significant effect of lactose level in the unsupplemented diets. Pigs offered high lactose diets showed significantly increased total VFA concentration, molar proportions of butyric acid and reduced acetic acid compared to those offered low lactose diets. Pigs offered [beta]-glucanase supplemented diets showed reduced (P<0.05) total VFA concentration compared to unsupplemented diets. In conclusion, [beta]-glucanase supplementation improved diet digestibility and pig performance compared to the unsupplemented diet at the low lactose level only. There was no response of [beta]-glucanase supplementation at the high level of lactose.
Keywords: Lactose; Enzyme; Toasted barley

Ye Bang-Ce, LiSongyang, Zuo Peng, Li Xiao-hong, Simultaneous detection of sulfamethazine, streptomycin, and tylosin in milk by microplate-array based SMM-FIA, Food Chemistry, Volume

106, Issue 2, 15 January 2008, Pages 797-803, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.06.006.
(http://www.sciencedirect.com/science/article/B6T6R-4P06CN2-6/2/3a716602d0112b01df92a74a5cb5bcaa)
Abstract:
This paper presents an approach to simultaneously detect sulfamethazine, streptomycin, and tylosin in milk by indirect competitive multianalyte Fluorescence immunoassay (FIA). Microscope glass slides modified with agarose were used for the preparation of small molecule microarrays (SMMs). Bovine serum albumin (BSA) conjugates of the haptens were immobilized on glass slides. The system consists of four glass slides containing 96 wells formed by an enclosing hydrophobic mask, which precisely matches a standard microplate. All liquid handling and sample processing were fully automated as 96-wells ELISA format. Monoclonal antibodies against sulfamethazine, streptomycin, and tylosin allowed the simultaneous detection of the respective analytes. Antibody binding was detected by a second antibody labeled with Cy5 generating fluorescence, which was scanned with chip scanner. The detection limits for three analytes were 3.26 ng/ml (sulfamethazine), 2.01 ng/ml (streptomycin), and 6.37 ng/ml (tylosin), being far below the respective MRLs. The system proved to be the first SMM-FIA platform having the potential to test for numerous antibiotics in parallel, such being of considerable interest for the control of safety in the food industry.
Keywords: FIA; Microarray; Drug residue; Sulfamethazine; Streptomycin; Tylosin

Lingli Jiang, Jianshun Chen, Jingjing Xu, Xiaofeng Zhang, Shuna Wang, Huancan Zhao, Khamphouth Vongxay, Weihuan Fang, Virulence characterization and genotypic analyses of Listeria monocytogenes isolates from food and processing environments in eastern China, International Journal of Food Microbiology, Volume 121, Issue 1, 15 January 2008, Pages 53-59, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.10.007.
(http://www.sciencedirect.com/science/article/B6T7K-4R1MDX3-4/2/09811b5b9aea8b1765a549deb941ac5a)
Abstract:
In this study, twenty L. monocytogenes food-related isolates collected from eastern China Zhejiang province were compared by in vivo LD50 assays as well as in vitro cytopathic plaque forming assay. Nineteen L. monocytogenes isolates (19/20) were as virulent as reference strain 10403S, while the isolate M4 had low pathogenicity. The unique isolate M4 fell into lineage III based on the partial nucleotide variations of actA, while the other isolates belonged to the more common lineages I and II. L. monocytogenes isolates were grouped in 17 to 19 subtypes using pulsed-field gel electrophoresis (PFGE) with SmaI digestion, and multilocus sequence typing (MLST) based on three virulence genes (actA, inlA and inlB) and four housekeeping genes (betL, dat, recA and sigB). The virulence genes based MLST had better discriminatory power than that targeting the housekeeping genes (0.990 vs 0.895), similar to PFGE (0.976). An isolate from the processing desk was found having the same pulsotype as the two isolates from final shrimp products in the same plant, indicating that process contamination could be the source of Listeria contamination.
Keywords: Listeria monocytogenes; Pathogenicity; MLST; PFGE typing; Contamination

Hector Rodriguez, Blanca de las Rivas, Carmen Gomez-Cordoves, Rosario Munoz, Characterization of tannase activity in cell-free extracts of Lactobacillus plantarum CECT 748T, International Journal of Food Microbiology, Volume 121, Issue 1, 15 January 2008, Pages 92-98, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.002.
(http://www.sciencedirect.com/science/article/B6T7K-4R40SHC-2/2/213b24354c3c51eb90d2faac3d119b52)
Abstract:

In foods, tannins are considered nutritionally undesirable. Spectrophotometric methods have been used to detect tannin degradation by L. plantarum strains isolated from food substrates. Enzymatic degradation of tannic acid by L. plantarum CECT 748T was examined in liquid cultures and in cell-free extracts by HPLC. Significative reduction of tannic acid was not observed during incubation in the presence of L. plantarum cells after 7 days incubation. However, tannic acid was effectively degraded by cell-free extracts of L. plantarum during 16 h incubation. We have partially characterized L. plantarum tannase activity by measuring its esterase activity on methyl gallate. Tannase activity was optimal at pH 5.0 and 30 [degree sign]C, and showed nearly 75% of the maximal activity at 50 [degree sign]C. The biochemical characteristics showed by L. plantarum tannase are considered favourable for tannin biodegradation in the food-processing industry.
Keywords: Lactobacillus plantarum; Tannase; Phenolic compounds; Tannic acid; Gallic acid

Kalliopi Rantsiou, Valentina Alessandria, Rosalinda Urso, Paola Dolci, Luca Cocolin, Detection, quantification and vitality of Listeria monocytogenes in food as determined by quantitative PCR, International Journal of Food Microbiology, Volume 121, Issue 1, 15 January 2008, Pages 99-105, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.11.006.
(http://www.sciencedirect.com/science/article/B6T7K-4R4665C-2/2/c976862bf53795bf7a184097bad28d45)
Abstract:
In this paper we describe the development of a quantitative PCR (qPCR) technique to detect, quantify and determine the vitality of Listeria monocytogenes in foods. The method was based on the amplification of the intergenic region spacer (IGS) between the 16S and 23S rRNA genes. A panel of more than 100 strains of Listeria spp. and non-Listeria was used in order to verify the specificity of the primers and Taqman probe and amplification signals were obtained only when L. monocytogenes DNA and RNA were loaded in the qPCR mix. Standard curves were constructed in several food matrices (milk, meat, soft cheese, fermented sausage, cured ham and ready-to-eat salad). The quantification limit was of 103-104 cfu/g or ml, while for the determination of vitality it was 104-105 cfu/g or ml. After an overnight enrichment in BHI at 37 [degree sign]C also 10 cfu/g or ml could be detected in all the matrices used in this study. When we applied the protocol to food samples collected from the market or from small food processing plants, on a total number of 66 samples, 4 fresh cheeses from raw milk gave positive results prior to the overnight incubation, while 9 samples, of which only one represented by fresh meat and the others by cheeses from raw milk, were positive after the enrichment. Out of the 4 positive samples, only one could be quantified and it was determined to contain 4 x 103 cfu/g.
Keywords: Listeria monocytogenes; Real-Time PCR; Detection; Quantification; Vitality

Ira Altman, Thomas Johnson, The choice of organizational form as a non-technical barrier to agro-bioenergy industry development, Biomass and Bioenergy, Volume 32, Issue 1, January 2008, Pages 28-34, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2007.06.004.
(http://www.sciencedirect.com/science/article/B6V22-4PFDPGN-1/2/cd9bc91b61a8971159afddd570e46341)
Abstract:
This paper presents arguments for the importance of market organization in the development of agro-bioenergy industries. One organizational theory, transaction cost economics, highlights the proposed perspective and defines organizational problems that can be typical in agro-bioenergy industries. After considering general features of the current US biopower industry, relying on a survey of power plants actively using forestry and food-processing co-products as fuel, two hypothetical examples illustrate the transaction cost perspective and potential problems that can arise. Finally, possible organizational features and organizational forms in the future agro-bioenergy industry, based on crop residue and energy crops in the US, are presented utilizing transaction cost economics as a foundation. The paper concludes that if organizational issues are

not adequately addressed by social scientists, new and mature technologies alike may stay under-developed commercially.
Keywords: Agro-bioenergy; Industry development; Biopower industry; Organizational choice; Transaction costs

Afaf S. Fahmy, Amal Z. Abo-Zeid, Tarek M. Mohamed, Hala M. Ghanem, Ibrahim H. Borai, Saleh A. Mohamed, Characterization of esterases from Cucurbita pepo cv. 'Eskandrani', Bioresource Technology, Volume 99, Issue 2, January 2008, Pages 437-443, ISSN 0960-8524, DOI: 10.1016/j.biortech.2006.11.062.
(http://www.sciencedirect.com/science/article/B6V24-4N4S0H0-3/2/9a2de54570d3ba9efd47d48bfac2739e)
Abstract:
Two of the six esterases identified in Cucurbita pepo cv. 'Eskandrani' were purified to homogeneity using two chromatography steps: anion exchange and gel filtration. The molecular weights of C. pepo esterases EIc and EII were 50,000 +/- 1500 and 68,000 +/- 1900 Da from gel filtration and 47,000 and 66,000 Da from SDS/PAGE, respectively, suggesting a monomeric structure for both enzymes. Esterases EIc and EII had Km values of 1.22 and 1.56 mM and pH optima at 9.0 and 8.0, respectively. The substrate specificity of C. pepo esterases EIc and EII were determined for a number of p-nitrophenyl esters, where their affinity toward these substrates were decreased as carbon atom number increased. Esterases EIc and EII had the same temperature optima, 40 [degree sign]C. Thermal stability studies of esterases EIc and EII indicated that half maximal activities of EIc and EII esterases were reached at 55 [degree sign]C and 50 [degree sign]C, while they lost 45%, 51% and 70%, 77% of their activities after 30 and 90 min of incubation at 40 [degree sign]C, respectively. The effect of different metal cations and inhibitors were examined. The inhibition studies revealed that the active sites of the two esterases contain serine and cysteine residues. The characteristics of C. pepo esterases are closely similar to those of microbial esterases used in food processing and food industry.
Keywords: Esterase; Cucurbita pepo cv. 'Eskandrani'; Purification; Characterization

David A. Gray, Sarah E. Bowen, Imad Farhat, Sandra E. Hill, Lipid oxidation in glassy and rubbery-state starch extrudates, Food Chemistry, Volume 106, Issue 1, 1 January 2008, Pages 227-234, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.05.095.
(http://www.sciencedirect.com/science/article/B6T6R-4NYD8WM-5/2/155aa603862ba327583b8bad9eb69efe)
Abstract:
This work describes the principle of protecting polyunsaturated fatty acids by holding them in the low moisture/solid/glassy-state starch matrix. One strategy already employed commercially is to encapsulate oil droplets within a solid wall that is highly impermeable to oxygen. These microencapsulated powders can then be added to foods. A shorter route would be to add PUFA-rich oils directly into a food formulation during the processing of a low moisture product. This should effectively encapsulate the valuable oils and protect them from oxidation. [omega]-6 Linoleic acid was incorporated into a waxy maize starch matrix via extrusion cooking. Linoleic acid oxidation occurred when this model food system was held in both the glassy and rubbery states (0.3 and 0.95 Aw, respectively) at 50 [degree sign]C. The initial oxidation, not surprisingly, occurs near the surface, but interestingly the highest initial rate of lipid oxidation occurred, not in the rubbery samples, but in glassy state starch extrudates with surface micro-cracks.
Keywords: Linoleic acid; Oxidation; Hexanal; Extrusion; Water activity; Glassy state; Rubbery state; Starch

A.O. Obadina, O.B. Oyewole, L.O. Sanni, K.I. Tomlins, A. Westby, Identification of hazards and critical control points (CCP) for cassava fufu processing in South-West Nigeria, Food Control,

Volume 19, Issue 1, January 2008, Pages 22-26, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.01.002.
(http://www.sciencedirect.com/science/article/B6T6S-4MYVG61-1/2/2cce1ddb62c18df887eb792ca2f73805)
Abstract:
A hazard analysis survey of wet fufu processing was carried out for five processors around Abeokuta. This analysis consisted of observing the raw materials and environment, watching all steps of the processing, recording pH during steeping/fermentation, and collecting of samples from diced cassava, washed cassava, soaked cassava and wet fufu for total viable count, Coliform, Staphylococcal and Bacillus counts. The pH of steeping/fermentation for the processors varies between 4.08 and 4.58. The total viable count increases with increase in pH level of the wet fufu and Coliforms, Bacillus cereus and Staphylococcus aureus were isolated from the wet fufu. The presence of Coliforms, S. aureus and B. cereus indicates that the processing is carried out in a highly contaminated environment. Education of processors on the hazards, critical control point (CCP) and the importance of hygienic environment is imperative. Therefore, control measures and proper monitoring procedures for wet fufu processing are suggested.
Keywords: Cassava; Wet fufu; CCP; Food safety; Hazards

Tais B. de Souza, Adriano G. da Cruz, Mirian R.L. Moura, Ana Claudia de M. Vieira, Anderson de S. Sant'Ana, Microscopic quality indicators of minas frescal cheese, Food Control, Volume 19, Issue 1, January 2008, Pages 71-75, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.02.004.
(http://www.sciencedirect.com/science/article/B6T6S-4N43RPS-1/2/877806ea8d19a392119fc973162d72ea)
Abstract:
Thirty samples of fresh minas-type cheese from 10 commercial brands, all registered in the Brazilian Food Sanitary Inspection, were submitted to microscopic analyses carried out in triplicate for each brand. 100.0% of the samples presented foreign matter and filth, including, in greater amounts, burnt matter (32.4%) and synthetic (5.5%) and vegetable (2.6%) material fragments and, in smaller amounts, sand grains, macroscopic fragment of synthetic origin and human hair (<1.0%). 2 (20.0%) commercial brands being presented rodent hairs, being classified as unsuitable for human consumption, due to its the association of these with foodborne diseases. The results showed the need for the adoption of quality assurance systems such as Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP) and Standard Sanitary Operational Procedures (SSOP) in order to offer safe products to the consumers, apart from reinforcing official inspection visits to the production units. They also reinforced the importance of using food microscopy as a quality control tool in food processing.
Keywords: Frescal minas cheese; Microscopy; Quality

V. Devesa, D. Velez, R. Montoro, Effect of thermal treatments on arsenic species contents in food, Food and Chemical Toxicology, Volume 46, Issue 1, January 2008, Pages 1-8, ISSN 0278-6915, DOI: 10.1016/j.fct.2007.08.021.
(http://www.sciencedirect.com/science/article/B6T6P-4PGPVX4-7/2/099f502a050542607ad435a364918f97)
Abstract:
In arsenic-endemic and other areas, food is an important path of exposure to this contaminant. Food is generally consumed in processed form, after a preservation treatment or cooking, which may alter the concentrations and chemical forms of arsenic. This article summarizes and discusses the work so far published on the effect that thermal treatment used in the cooking or processing of food, including sterilization and preservation stages, has on total arsenic and arsenic species contents. It also reviews possible transformations in arsenic species. The studies included use model systems or food products of marine or vegetable origin. Processing may cause a

considerable increase or decrease in the real arsenic intake from food. For example, traditional washing and soaking of Hizikia fusiforme seaweed, which has very high inorganic arsenic contents, may reduce the contents by up to 60%. On the other hand, all the arsenic present in cooking water may be retained during boiling of rice, increasing the contents of this metalloid to significant levels from a toxicological viewpoint. This calls for modifications in arsenic risk assessment, hitherto based on analysis of the raw product. It is necessary to consider the effect of processing on total arsenic and arsenical species in order to obtain a realistic view of the risk associated with intake in arsenic-endemic and other areas.
Keywords: Arsenic; Arsenic species; Food; Transformations; Cooking; Refrigeration; Freezing; Canning

Mahuya Bandyopadhyay, Runu Chakraborty, Utpal Raychaudhuri, Effect of beet and honey on quality improvement and carotene retention in a carrot fortified milk product, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 9-17, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.007.
(http://www.sciencedirect.com/science/article/B6W6D-4NJ7WBT-2/2/8f71185cf0ccd3ca0d69aaef110334a3)
Abstract:
The effect of beet and honey on quality attributes and carotene retention of carrot fortified milk product during storage at 30 [degree sign]C were studied. Six types of samples were prepared and stored in a close container at 30 [degree sign]C for 10 days. The samples were CC [chhana (a heat and acid coagulated milk protein mass i.e. casein mass, analogous to cottage cheese):carrot = 1:1], CCB1 (chhana:carrot:beet = 2:1:1), CCB2 (chhana:carrot:beet = 4:3:1), CCH1 (chhana:carrot:honey = 2:1:1), CCH2 (chhana:carrot:honey = 4:3:1) and CCBH (chhana:carrot:beet:honey = 3:1:1:1). Effect of beet and honey on the quality of the samples was evaluated on the basis of changes in acidity, pH, free fatty acid level and sensory analysis of the samples. Carotene retention was determined on the basis of amount of carotene degraded after processing and storage. With the longer storage time, acidity, free fatty acid content increased and pH, carotene retention as well as colour preferences and overall acceptance decreased for all the samples. Addition of beet and honey in both proportion to the product showed synergistic role i.e. they reduced the acidity and free fatty acid formation, pH reduction and carotene degradation. However, regarding sensory evaluation, honey addition to the carrot based milk product showed better result. Equal mixture of carrot, beet and honey was best regarding antioxidant activity and retention of carotene. The study showed in overall that addition of equal mixture of beet and honey along with carrot is effective for quality improvement and carotene retention of carrot fortified milk product.Industrial relevance
This study is of relevance because it deals with the effectiveness of natural antioxidant sources (beet and honey) in quality improvement and carotene retention of carrot fortified milk product. Fortification of carrot in milk products at higher concentration (1:1) is a new idea. In addition to that, fortification of beet and honey in carrot fortified milk product for quality improvement and carotene retention is an innovative work. The data represented in the work suggest that addition of 1:1 mixture of beet and honey along with carrot is effective for quality improvement and carotene retention of carrot fortified milk product. The use of natural antioxidant sources particularly in food is always recommended as safe and good medicines for health as well as several diseases. This innovative idea confers benefits in the dairy industry as well as in the agriculture industry by building a bridge between these two industries. Besides, this technology can reduce the spoilage of agricultural commodities due to seasonal glut.
Keywords: Beet; Honey; Carotene; Antioxidant activity; Sensory evaluation; Carrot

Xuan Liu, Yanxiang Gao, Xiaoting Peng, Bin Yang, Honggao Xu, Jian Zhao, Inactivation of peroxidase and polyphenol oxidase in red beet (Beta vulgaris L.) extract with high pressure carbon

dioxide, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 24-31, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.010.
(http://www.sciencedirect.com/science/article/B6W6D-4NR18G0-2/2/3722694c2fa620bcc4ee35146610fcf0)
Abstract:
The inactivation of peroxidase (POD) and polyphenol oxidase (PPO) in red beet extract with high pressure carbon dioxide (HPCD) was investigated. HPCD treatment at 37.5 MPa for POD and 22.5 MPa for PPO (55 [degree sign]C, 60 min) resulted in a reduction of their activities by approximately 86% and 95%, respectively. Compared with thermal treatment (55 [degree sign]C), the decimal reduction time (D) of POD and PPO was reduced from 555.56 min to 74.63 min and 161.29 min to 38.31 min, respectively, by the HPCD treatment. The inactivation process followed first-order kinetics ($R2 > 0.84$, $p < 0.05$) with D values declining with the rise of pressure and temperature. The activation energy of the inactivation was reduced by the HPCD treatment from 92.54 kJ/mol to 68.63 kJ/mol and 57.06 kJ/mol to 53.58 kJ/mol for POD and PPO, respectively. Analysis of the kinetic parameters of the inactivation showed that both POD and PPO were less sensitive to pressure changes under supercritical than subcritical conditions.Industrial relevance
There is a strong interest in the food industry in developing non-thermal processing techniques to produce fresher, safer and higher quality food. High pressure carbon dioxide (HPCD) is one of the emerging non-thermal technologies for inactivating microorganisms and enzymes in food products. Peroxidase (POD) and polyphenol oxidase (PPO) are two common enzymes that can cause quality deterioration in many food products. This work explores the feasibility of inactivating POD and PPO in red beet extracts by HPCD and establishes the inactivation kinetic models. These models are useful in understanding the responses of POD and PPO activities to changes in the HPCD parameters including pressure, temperature and process time. The models may also be used in assisting the design of industrial-scale HPCD processes.
Keywords: Peroxidase; Polyphenol oxidase; Red beet extract; High pressure carbon dioxide; Inactivation

Daniel Rico, Ana B. Martin-Diana, Catherine Barry-Ryan, Jesus M. Frias, Gary T.M. Henehan, Jose M. Barat, Use of neutral electrolysed water (EW) for quality maintenance and shelf-life extension of minimally processed lettuce, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 37-48, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.05.002.
(http://www.sciencedirect.com/science/article/B6W6D-4NS2GJX-1/2/1489a7a75dd305d63e9b4cb4cc223e1f)
Abstract:
Experiments were conducted to determine the effectiveness of different treatments based on the use of neutral electrolysed water (EW) on fresh-cut lettuce. EW was diluted to obtain different free chlorine concentrations (120, 60 and 12 ppm) and to compare with standard washing treatment of 120 ppm chlorine solution. Shelf-life quality and safety markers were studied at the beginning and at the end of the 7-day-storage at 4 [degree sign]C. The use of EW decreased the respiration rate of the samples which might be related with the observed reduction in microbial spoilage. The use of EW also increased the activity of a browning-related enzyme (polyphenoloxydase) although sensory results showed all samples as acceptable at the end of the 7 day-storage. Perhaps longer storage time might increase the risk to browning development in the samples treated with EW. The highest EW concentration (120 ppm free chlorine) was the most effective treatment in reducing sample microbial load; however this treatment also affected the final produce with effects such as loss of turgor, plasmolysis and a reduction in mineral content.
Results suggest an intermediate EW concentration with 60 ppm free chlorine could be an alternative to 120 ppm chlorine (from sodium hypochlorite) for sanitizing fresh-cut vegetables, reducing to half the amount of chlorine used and maintaining the antimicrobial effectiveness and

without differences affecting the quality. However further studies will be necessary in order to observe the effect of the oxidising capacity of EW on other quality and safety markers as pathogens and nutritional content.Industrial relevance
Chlorine solutions have been widely used to sanitise fruit and vegetables in the fresh-cut industry. However, the association of chlorine with the possible formation of carcinogenic chlorinated compounds in water has called into question the use of chlorine in food processing. The efficacy in controlling the microbial load and browning of samples treated with electrolysed water shows it as a promising decontaminant agent for fresh-cut lettuce. Due to the high oxidising potential of the EW quality requirements must be balanced to obtain the optimal treatment conditions keeping satisfying safety levels. The use of EW-60 showed similar safety and quality (browning) results as the use of chlorine or double EW concentration (EW-120). However the treatment EW-120 affected negatively the textural properties. The study suggests the use of EW-60 as an alternative to sodium hypochlorite solution with 120 ppm available chlorine, obtaining similar safety and quality results and reducing the amount of chlorine needed. Further investigations in the effect of EW on lettuce, such as those on pathogens or nutritional markers (e.g. carotenoids and vitamin C) are recommended in order to explore this alternative that might reduce the increasingly concerning use of chlorine to decontaminate this type of product.
Keywords: Neutral activate water; Lettuce; Quality; Decontamination; Fresh-cut; Minimally processed

Michael Zeece, Thom Huppertz, Alan Kelly, Effect of high-pressure treatment on in-vitro digestibility of [beta]-lactoglobulin, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 62-69, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.05.004.
(http://www.sciencedirect.com/science/article/B6W6D-4NVH7X4-1/2/5d7db5a7bedd50a327bd0b36c0b36fb1)
Abstract:
The effect of high-pressure (HP)-treatment on [beta]-lactoglobulin ([beta]-Lg) was investigated using in-vitro pepsin digestion under simulated gastric conditions. HP-treatment of [beta]-Lg at 400 MPa for 10 min only slightly increased its subsequent hydrolysis by pepsin. However, higher pressure treatments (600 and 800 MPa) resulted in rapid digestion of [beta]-Lg. After these higher pressure treatments, [beta]-Lg disappeared in less than 1 min of pepsin incubation as determined by SDS-PAGE analysis. Mass spectrometry analysis of the digestion products at corresponding incubation times revealed rapid and progressive degradation of [beta]-Lg. Most (> 90%) of the peptide products following pepsin digestion of HP-treated [beta]-Lg were less than 1500 Da in size. Peptide products from pepsin digestion were identified and mapped to [beta]-strand regions (Leu32-Leu54 and Phe82-Leu104) and to the N- and C-terminals regions (Leu1-Leu10 and Ser150-Leu156) of [beta]-Lg. While these regions corresponded to known IgE epitopes of [beta]-Lg, the predominant peptides resulting from 60 s of incubation were short (7-10 residues) in length. These results demonstrate that HP-treatment increased the digestibility of [beta]-Lg and represents a promising processing technology for reducing the allergenicity of known allergens in a wide variety of food materials.Industrial relevance
High-pressure treatment is widely used to enhance the functional attributes of food proteins. The potential for enhanced nutritional value of [beta]-Lg was also demonstrated here by its increased digestibility. High-pressure treatment followed by incubation with proteases may represent a method for the commercial production of bioactive peptides such as inhibitors of angiotensin converting enzyme. More importantly, high-pressure-induced unfolding of milk proteins may reduce their allergenicity. Unfolded proteins are less likely to become agents of immunological sensitization because they are more readily hydrolyzed. Thus high-pressure treatment applied to food ingredients such as whey protein isolate may contribute to the development of hypoallergenic foods.
Keywords: [beta]-Lactoglobulin; High-pressure; In-vitro pepsin digestion; Proteolysis

Shiyi Ou, Qilin Lin, Yuping Zhang, Caihuan Huang, Xi Sun, Liang Fu, Reduction of acrylamide formation by selected agents in fried potato crisps on industrial scale, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 116-121, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.06.008.
(http://www.sciencedirect.com/science/article/B6W6D-4P59XB5-3/2/663b77b593acb264644869eef25c47b3)
Abstract:
Great interest and rapid research efforts on acrylamide in foods followed an announcement in April 2002 by the Swedish National Food Authority and the University of Stockholm. Reduction of acrylamide in high-temperature processing foods, including selection of the raw material and variation of processing parameters, etc. were extensive reported. In this research, effect of some agents on acrylamide formation was investigated. A glucose-asparagines reaction model system was used to test the effect of ferulic acid, catechin, CaCl2, NaHSO3, and l-cysteine on inhibition of acrylamide formation and three efficient inhibitors, NaHSO3, CaCl2 and l-cysteine were screened. The results showed that immersing of the fresh potato chips using different concentration of the agents greatly inhibited acrylamide formation in fried potato crisps, and the efficiency increased as their concentrations increased; among them, l-cysteine is the most efficient agent but CaCl2 is most potential. Effects of these food additives on the texture of fried potato crisps were also studied. It was found that l-cysteine showed little effect on the texture of the crisps and CaCl2 is regarded as the suitable choice because of its low price and the acceptable mouth feel of fried crisps treated by CaCl2, although it increased the brittleness. Moreover, the application of CaCl2 in industrial production of fried potato crisps was also studied. In the blanching process (deactivation process of enzymes at 85 [degree sign]C), a computerized electrical conductivity detector was used to keep the concentration of CaCl2 at constant and the result showed that immersion of potato slices in CaCl2 solution at 5 g/L reduced acrylamide formation by more than 85% in fried crisps.Industrial relevance
This research presents a technology to inhibit acrylamide formation in fried potato chips by immersion of fresh potato chips with some food additives. The approach suggested that cysteine and calcium chloride significantly decreased the content of acrylamide in fried potato chips and their concentrations could be kept constant by using a conductor as a detector.
Keywords: Acrylamide; Agents; Potato crisps; Inhibition

Jian-Feng Sun, Yutaka Kitamura, Takaaki Satake, Application of Stirling cooler to food processing: Feasibility study on butter churning, Journal of Food Engineering, Volume 84, Issue 1, January 2008, Pages 21-27, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.04.020.
(http://www.sciencedirect.com/science/article/B6T8J-4NM505F-1/2/7036fed0cff11ff89afc7bfb972352ce)
Abstract:
The Stirling cycle engine was invented almost 190 years ago. In this study, the reverse Stirling cycle is investigated for use in refrigeration. This type of cycle is referred to as Stirling cooling or cooler. An experimental free-piston Stirling cooler (FPSC) was constructed and the effects of the device parameters in relation to the performance of the cooler were studied; the equipment was then experimentally applied to churning butter. Two effect parameters, namely, the size of the displacer involving heat regeneration and the volume of the working fluid (air) were studied. The results indicated that a larger displacer resulted in a lower temperature in the cooler. When the working fluid volume was large or the compression ratio was high, the cooling effect was enhanced. It was concluded that by churning butter using the Stirling cooler, coagulation of the butter occurred more rapidly than when the contral was used in the process; the water content of the butter obtained was lower and the fat content was higher using the Stirling cooler. This implies that the feasibility of using the Stirling cooler for churning butter is high.

Keywords: Stirling cooler; Device parameters; Displacer; Working fluid; Butter churning

Aylin Altan, Kathryn L. McCarthy, Medeni Maskan, Evaluation of snack foods from barley-tomato pomace blends by extrusion processing, Journal of Food Engineering, Volume 84, Issue 2, January 2008, Pages 231-242, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.05.014.
(http://www.sciencedirect.com/science/article/B6T8J-4NS2G96-5/2/2ee9bd974607a98b2cf1f298a6df54ae)
Abstract:
Blends of barley flour and tomato pomace were processed in a co-rotating twin-screw extruder. Experimental design with die temperature (140-160 [degree sign]C), screw speed (150-200 rpm) and tomato pomace level (2-10%) as independent variables produced 20 different combinations that were studied using response surface methodology to investigate the effect of these variables on system parameters (SME, die melt temperature and die pressure) and product responses (expansion, bulk density, water absorption and solubility indices, texture and color). Extrudate from five experiments within 20 samples was selected for sensory evaluation in terms of color, texture, taste, off-odor and overall acceptability. Regression equations describing the effect of each variable on the system parameters and product responses were obtained. The system parameters and product responses were most affected by changes in temperature, pomace level and to a lesser extent by screw speed. Extrudates with 2% and 10% tomato pomace levels extruded at 160 [degree sign]C and 200 rpm had higher preference levels for parameters of color, texture, taste and overall acceptability. The results suggest that tomato pomace can be extruded with barley flour into an acceptable and nutritional snack.
Keywords: Extrusion cooking; Barley; Tomato pomace; Response surface methodology

John S. Mounsey, E. Dolores O'Riordan, Influence of pre-gelatinised maize starch on the rheology, microstructure and processing of imitation cheese, Journal of Food Engineering, Volume 84, Issue 1, January 2008, Pages 57-64, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.04.017.
(http://www.sciencedirect.com/science/article/B6T8J-4NKJ07G-7/2/80ee5c06a3d2ae4d1fe82e223eb59662)
Abstract:
Imitation cheeses were manufactured with increasing levels (0-9%, w/w) of pre-gelatinised maize starch in partial replacement of rennet casein. At increased starch levels, longer processing times (10 min at 78 [degree sign]C using 9%, w/w starch) were necessary compared to the control (5 min) because of the reduced protein present to emulsify/stabilise the fat droplets. Scanning electron and confocal microscopy revealed that increased starch addition resulted in a less homogeneous protein matrix, with a honeycomb appearance although the fat globules remained small and uniformly sized. With increased levels of starch up to 9% (w/w), the storage modulus, peak stress and stress relaxation times significantly increased while hardness values remained unchanged. Results indicated that the inclusion of pre-gelatinised maize starch impaired the hydration of the casein as well as the thermoplastic properties of the imitation cheese and has most application in food products where flow resistance is required, particularly at increased temperatures.
Keywords: Pre-gelatinised maize starch; Imitation cheese; Microscopy; Rheology; Processing conditions

Glen Mullineux, Mark J.H. Simmons, Influence of rheological model on the processing of yoghurt, Journal of Food Engineering, Volume 84, Issue 2, January 2008, Pages 250-257, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.05.015.
(http://www.sciencedirect.com/science/article/B6T8J-4NSMMM1-2/2/c8ef2b8b28ba9b483c4f77e8658730f2)
Abstract:

The power law and the Herschel-Bulkley model are common ways of representing the behaviour of a number of food materials. The underlying relations contain parameters which are obtained by fitting to experimental results. There is evidence to suggest that both models can represent materials equally well and this is investigated. With the Herschel-Bulkley model, it is shown that good fits can be obtained to data points with significantly different values of the parameters, including the particular case of the power law. This arises due to a linear relation between certain logarithmic terms. This is characterised and used to provide a means for converting between good triples of Herschel-Bulkley parameters. The fact that the two models behave equally well raises the question as to whether it is better to use the power law (being the simpler) for predictive work in the design of production systems where the materials experience medium to high shear rates in pipelines.
Keywords: Power law; Herschel-Bulkley model; Yoghurt

David P. Watts, Scavenging by chimpanzees at Ngogo and the relevance of chimpanzee scavenging to early hominin behavioral ecology, Journal of Human Evolution, Volume 54, Issue 1, January 2008, Pages 125-133, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2007.07.008.
(http://www.sciencedirect.com/science/article/B6WJS-4PS5DYM-1/2/dbd99738ad37944a10376cfb12792e4a)
Abstract:
Chimpanzees regularly hunt a variety of prey species. However, they rarely scavenge, which distinguishes chimpanzee carnivory from that of some modern hunter-gatherers and, presumably, at least some Plio-Pleistocene hominins. I use observations made over an 11-year period to document all known opportunities for scavenging encountered by chimpanzees at Ngogo, Kibale National Park, Uganda, and describe all cases of scavenging. I also review data on scavenging from other chimpanzee research sites. Chimpanzees at Ngogo encountered scavenging opportunities only about once per 100 days and ate meat from scavenged carcasses only four times. Scavenging opportunities are also rare at other sites, even where leopards are present (Mahale, Tai, Gombe), and scavenging of leopard kills is known only from Mahale. Feeding on prey that chimpanzees had hunted but then abandoned is the most common form of scavenging reported across study sites. For example, several individuals at Ngogo ate meat from a partially consumed red colobus carcass abandoned after a hunt the previous day. Such behavior probably was not common among Oldowan hominins. Ngogo data and those from other sites also show that chimpanzees sometimes eat meat from carcasses of prey that they did not see killed and that were not killed by chimpanzees, and that scavenging allows access to carcasses larger than those of any prey items. However, chimpanzees ignore relatively many opportunities to obtain meat from such carcasses. Scavenging may be rare because fresh carcasses are rare, because the risk of bacterial infections and zoonoses is high, and because chimpanzees may not recognize certain species as potential prey or certain size classes of prey species as food sources. Its minimal nutritional importance, along with the absence of technology to facilitate confrontational scavenging and rapid carcass processing, apparently distinguishes chimpanzee foraging strategies from those of at least some Oldowan hominins.
Keywords: Chimpanzees; Meat eating; Oldowan hominins; Scavenging

Stano Pekar, Jan Hubert, Assessing biological control of Acarus siro by Cheyletus malaccensis under laboratory conditions: Effect of temperatures and prey density, Journal of Stored Products Research, Volume 44, Issue 4, 2008, Pages 335-340, ISSN 0022-474X, DOI: 10.1016/j.jspr.2008.02.011.
(http://www.sciencedirect.com/science/article/B6T8Y-4SSGCMG-1/2/b6f8efb9209a15ade46325923ba863e5)
Abstract:

In stored grain, the predatory mite Cheyletus spp. may be used to control the pest mite Acarus siro. The efficiency of control depends on many factors, particularly ambient temperature. In this study we investigated the effects of temperature and initial prey density on the prey-predator system under laboratory conditions. Ratio-response models were fitted to estimate the efficiency of control for three temperatures. At 15 [degree sign]C a 90% reduction of A. siro was achieved by releasing nine Cheyletus malaccensis individuals into a population of 100 A. siro individuals in 1 kg of grain. At 20 [degree sign]C, 90% reduction required seven C. malaccensis individuals and at 25 [degree sign]C, it required three C. malaccensis individuals. Without the predator the intrinsic rates of increase of A. siro populations increased with temperature and were highest for an initial density of 100 individuals, revealing some form of positive interaction among A. siro individuals during food processing. The intrinsic rates of increase of C. malaccensis populations also increased with temperature and decreased with increasing density of the predator, presumably as a result of interference competition among predators.
At 15 [degree sign]C the rate of increase for A. siro was higher than that for C. malaccensis, while at higher temperatures it was the other way around. Lower developmental thresholds were 10 [degree sign]C for A. siro and 13.6 [degree sign]C for C. malaccensis. In order to find when an artificial release of C. malaccensis is most efficient we simulated a population increase of A. siro using temperature records from one grain store. In Central Europe this type of biological control can be efficient only when the predator is released at the beginning of storage, i.e. in September and October.
Keywords: Predator-prey dynamics; Lower development threshold; Grain store; Cheyletus malaccensis; Acarus siro

O.J. Oyelade, T.Y. Tunde-Akintunde, J.C. Igbeka, M.O. Oke, O.Y. Raji, Modelling moisture sorption isotherms for maize flour, Journal of Stored Products Research, Volume 44, Issue 2, 2008, Pages 179-185, ISSN 0022-474X, DOI: 10.1016/j.jspr.2007.10.005.
(http://www.sciencedirect.com/science/article/B6T8Y-4RN48DR-1/2/d05b70f2b6cd6b813a10698c26527f67)
Abstract:
The sorption isotherm of food material is pertinent in the processing and storage of food products. Adsorption and desorption isotherms for maize flour were investigated using the static gravimetric method over the range of temperature (27-40 [degree sign]C) and water activity (aw) (0.10-0.80) commonly experienced in the tropical environment. The experimental data were compared with five widely recommended models in the literature for food sorption isotherms (GAB, modified GAB (MGAB), modified Oswin (MOE), modified Henderson (MHDE), and modified Chung-Pfost (MCE)). The GAB, MGAB, and MOE models were found to be acceptable in predicting the moisture sorption isotherms for maize flour. Overall, the MGAB appears to be most suitable for fitting the adsorption and desorption moisture isotherms data for the maize flour.
Keywords: Maize flour; Storage; Sorption isotherms; Acid solutions; Equilibrium moisture content

John N. Sofos, Challenges to meat safety in the 21st century, Meat Science, Volume 78, Issues 1-2, Symposium on Meat safety: From Abattoir to Consumer, January-February 2008, Pages 3-13, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.07.027.
(http://www.sciencedirect.com/science/article/B6T9G-4P96265-1/2/35ca99c35796b19ef8f45ea5d3ceb832)
Abstract:
The safety of meat has been at the forefront of societal concerns in recent years, and indications exist that challenges to meat safety will continue in the future. Major meat safety issues and related challenges include the need to control traditional as well as 'new,' 'emerging,' or 'evolving' pathogenic microorganisms, which may be of increased virulence and low infectious doses, or of resistance to antibiotics or food related stresses. Other microbial pathogen related concerns

include cross-contamination of other foods and water with enteric pathogens of animal origin, meat animal manure treatment and disposal issues, foodborne illness surveillance and food attribution activities, and potential use of food safety programs at the farm. Other issues and challenges include food additives and chemical residues, animal identification and traceability issues, the safety and quality of organic and natural products, the need for and development of improved and rapid testing and pathogen detection methodologies for laboratory and field use, regulatory and inspection harmonization issues at the national and international level, determination of responsibilities for zoonotic diseases between animal health and regulatory public health agencies, establishment of risk assessment based food safety objectives, and complete and routine implementation of HACCP at the production and processing level on the basis of food handler training and consumer education. Viral pathogens will continue to be of concern at food service, bacterial pathogens such as Escherichia coli O157:H7, Salmonella and Campylobacter will continue affecting the safety of raw meat and poultry, while Listeria monocytogenes will be of concern in ready-to-eat processed products. These challenges become more important due to changes in animal production, product processing and distribution; increased international trade; changing consumer needs and increased preference for minimally processed products; increased worldwide meat consumption; higher numbers of consumers at-risk for infection; and, increased interest, awareness and scrutiny by consumers, news media, and consumer activist groups. Issues such as bovine sponginform encephalopathy will continue to be of interest mostly as a target for eradication, while viral agents affecting food animals, such as avian influenza, will always need attention for prevention or containment.
Keywords: Meat; Safety; Pathogens; Hazards; Bacteria

Anna Jofre, Margarita Garriga, Teresa Aymerich, Inhibition of Salmonella sp. Listeria monocytogenes and Staphylococcus aureus in cooked ham by combining antimicrobials, high hydrostatic pressure and refrigeration, Meat Science, Volume 78, Issues 1-2, Symposium on Meat safety: From Abattoir to Consumer, January-February 2008, Pages 53-59, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.06.015.
(http://www.sciencedirect.com/science/article/B6T9G-4P429G3-2/2/6c0543cd87f4b8b9c124acd544e0e063)
Abstract:
Recontamination of ready-to-eat products such as cooked ham during post-processing may be the cause of outbreaks of food-borne disease. The effectiveness of the combination of high pressure processing (HPP) at 600 MPa with the natural antimicrobials nisin and potassium lactate has been evaluated in sliced cooked ham spiked with 4 Log CFU/g of Salmonella sp., Listeria monocytogenes and Staphylococcus aureus after 3-months of storage at 1 and 6 [degree sign]C. In non-HPP sliced cooked ham, the addition of nisin plus lactate inhibited the growth of L. monocytogenes during the entire storage period while the refrigerated storage inhibited the growth of Salmonella sp. and S. aureus. The application of an HPP reduced the levels of Salmonella and L. monocytogenes to levels below 10 CFU/g. These levels continued until the end of storage at both 1 and 6 [degree sign]C. HPP produced a reduction of less than 1 Log CFU/g to S. aureus. The combination of HPP, nisin and refrigeration at 6 [degree sign]C was necessary to decrease the levels of S. aureus by 2.4 Log CFU/g after 3-months of storage.
Keywords: Food-borne pathogens; High pressure processing; Lactate; Nisin; Ready to eat products

Karl-Otto Honikel, The use and control of nitrate and nitrite for the processing of meat products, Meat Science, Volume 78, Issues 1-2, Symposium on Meat safety: From Abattoir to Consumer, January-February 2008, Pages 68-76, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.05.030.
(http://www.sciencedirect.com/science/article/B6T9G-4P2J0CX-1/2/0543c00b7dc904455f9738774ce840e5)

Abstract:
Nitrate and nitrite are used for the purpose of curing meat products. In most countries the use of both substances, usually added as potassium or sodium salts, is limited. Either the ingoing or the residual amounts are regulated by laws.
The effective substance is nitrite acting primarily as an inhibitor for some microorganisms.
Nitrite added to a batter of meat is partially oxidized to nitrate by sequestering oxygen - thus it acts as an antioxidant - a part of nitrite is bound to myoglobin, forming the heat stable NO-myoglobin, a part is bound to proteins or other substances in meat. Nitrate may be reduced to nitrite in raw meat products by microorganisms.
As oxidation and reduction may occur the concentrations of nitrite plus nitrate in a product has to be controlled and measured especially if the residual amounts are regulated.
This sum of both compounds is important for the human body. Intake of nitrate with food leads to its absorption over the digestive tract into the blood. In the oral cavity nitrate appears again where it is reduced to nitrite. With the saliva the nitrite is mixed with food, having the same effect as nitrite in a batter (inhibiting growth of some pathogenic microorganisms) and swallowed. In the stomach nitrite can eventually form carcinogenic nitrosamines in the acidic environment.
Keywords: Nitrite; Nitrate; Meat products

Frank Vandendriessche, Meat products in the past, today and in the future, Meat Science, Volume 78, Issues 1-2, Symposium on Meat safety: From Abattoir to Consumer, January-February 2008, Pages 104-113, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.10.003.
(http://www.sciencedirect.com/science/article/B6T9G-4PXDM85-2/2/5a45a3d8fb59a5b05664714b797bb00c)
Abstract:
An illustrative overview is given of the history of meat products, emphasizing the present situation. Three different consecutive and complementary periods can be defined in terms of realisations, threats and opportunities. The 'Quality' period started about 15 years ago and was characterised by the introduction of the ISO Quality Systems Standards. A trend from product control towards system control for guaranteeing Food Safety and Quality was obvious. The 'Food Safety' Period started with the introduction of HACCP. Pushed by Food Safety scandals this period is characterised by a growing influence of authorities and legislation besides an increase in distribution requirements. The 'Nutrition and Health' period has only just started. Global health problems related to food and the (potential) answers of the meat industry are highlighted. For meat products the energy (fat) level, the sodium level and fat quality in terms of fatty acid composition are the main priorities.
Keywords: Food safety; Nutrition and health; Quality; Meat processing

T. Aymerich, P.A. Picouet, J.M. Monfort, Decontamination technologies for meat products, Meat Science, Volume 78, Issues 1-2, Symposium on Meat safety: From Abattoir to Consumer, January-February 2008, Pages 114-129, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.07.007.
(http://www.sciencedirect.com/science/article/B6T9G-4P6M66N-5/2/6a21b004a76298ede59bc0bfeffa8017)
Abstract:
Consumers demand high quality, natural, nutritious, fresh appearance and convenient meat products with natural flavour and taste and an extended shelf-life. To match all these demands without compromising safety, in the last decades alternative non-thermal preservation technologies such as HHP, irradiation, light pulses, natural biopreservatives together with active packaging have been proposed and further investigated. They are efficient to inactivate the vegetative microorganisms, most commonly related to food-borne diseases, but not spores. The combination of several non-thermal and thermal preservation technologies under the so-called hurdle concept has also been investigated in order to increase their efficiency. Quick thermal

technologies such as microwave and radiofrequency tunnels or steam pasteurization bring new possibilities to the pasteurization of meat products especially in ready to eat meals. Their application after final packaging will prevent further cross-contamination during post-processing handling. The benefits of these new technologies and their limitations in an industrial application will be presented and discussed.
Keywords: Non-thermal and thermal technologies; Meat; Irradiation; High hydrostatic pressure; Biopreservation and natural antimicrobials; Active packaging; Radio frequency and microwave heating; Ohmic heating; Steam pasteurization

Zhongbin (Ben) Zhang, Thermal Food Processing: New Technologies and Quality Issues, edited by Da-Wen Sun, Published by: CRC Taylor and Francis, 640 pages, 2006 $180, ISBN 1-57444-628-2., Trends in Food Science & Technology, Volume 19, Issue 1, January 2008, Page 48, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.05.004.
(http://www.sciencedirect.com/science/article/B6VHY-4NT9G9S-2/2/776e899579fcaa738bc2c77e60134b0f)

Niels Skovgaard, New trends in emerging pathogens, International Journal of Food Microbiology, Volume 120, Issue 3, 15 December 2007, Pages 217-224, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.046.
(http://www.sciencedirect.com/science/article/B6T7K-4PC3S80-7/2/616fd9e56fe4338c8cc8729fd47ae045)
Abstract:
The emergence of pathogens is the result of a number of impact in all parts of the food chain.
The emerging technologies in food production explain how new pathogens can establish themselves in the food chain and compromise food safety. The impact of the food technology is analysed for several bacteria, such as Yersinia, Campylobacter, Arcobacter, Helicobacter pullorum, Enterobacter sakazakii, Mycobacterium avium spp. paratuberculosis, prions related to vCJD and others. The importance of the ability of many microbes to form VBNC forms is elaborated on. Research on culture independent methods may address this outstanding issue to the better understanding of emerging pathogens. The 'demerging' of pathogens also occur, and examples of this are explained.
The reaction of bacteria to stresses and sublethal treatments, and how exposure to one stress factor can confer resistance to other stresses, literally speaking causing contagious resistance, are explained. The implication of this e.g. in modern approaches of food preservation, such as Minimally processed Foods, is considerable. Intestinal colonization of EHEC may be regulated by Quorum sensing, and this ability of microbes plays an important role in the colonization of microbes in food and on food processing equipment, an important factor in the emergence of pathogens.
The emergence of Saccharomyces cerevisiae, as an opportunistic human pathogen, used for centuries for food and production of alcoholic beverages, calls for research in molecular tools to distinguish between probiotic and clinical strains.
Cyclospora cayetanensis and Norovirus outbreaks can no longer be designated as emerging pathogens, they share however one characteristic in the epidemiology of emerging nature, the importance of the hygiene in the primary production stage, including supply of potable water, and the application of GMP and the HACCP principles in the beginning of the food chain.
Hepatitis E virus is a potential emerging food borne pathogen and swine may serve as a source of infection in human, a most challenging issue in greater part of the world raising pigs. Tick-borne encephalitis virus infection, either thick borne or caused by consumption of raw milk, is an increasing trend in the industrialized part of the world.
Consumer awareness, ethics of food, sustainability in food production, and trust in foods, are of growing importance to the consumer. The reaction of the consumer to new technology, such as

nanotechnology, is unpredictable. Many efforts should be devoted to communication of non-biased information to both the food producers as well as the consumer.
Keywords: Farm-to-fork; 'Demerging' pathogens; Stress response; Quorum sensing; Consumer awareness; Communication

Efstathios S. Giotis, Ian S. Blair, David A. McDowell, Morphological changes in Listeria monocytogenes subjected to sublethal alkaline stress, International Journal of Food Microbiology, Volume 120, Issue 3, 15 December 2007, Pages 250-258, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.08.036.
(http://www.sciencedirect.com/science/article/B6T7K-4PMJJX7-1/2/5c1f1078147cd33a694a085f740ce76e)
Abstract:
Scanning electron microscopy (SEM) studies revealed that exposure to 4lethal alkaline stress induced statistically significant ($P < 0.05$) changes in mean cell length, radius and volume in Listeria monocytogenes and a derived [sigma]B deficient mutant. Bacterial morphology was altered at pH values above 9.0, to include single filamentous or elongated chain forms. Such filamentation and chain formation was observed in the parent strain and in the [sigma]B deficient strain, and in buffered and non-buffered media. Giemsa staining revealed that the filaments were multi-nucleate, with nucleoids spaced along the length of the atypical cells. In buffered media, longer alkaline exposure was associated with increases in the frequency and length of filamentation. In non-buffered medium, longer exposure was associated with gradual decline in length and the frequency of observation of filaments. Transfer of alkaline treated cells to neutral conditions was associated with the formation of septa within filaments, cell division, and a rapid return to normal morphology, i.e. within 3 h. The observed effects, and their reversibility, may be important in increasing the alkaline tolerance of this pathogen during phagocytosis within the innate human immune system response, and in adaptation/survival in food environments treated with alkali detergents and/or sanitisers. Such atypical cells may be associated with increased survival of L. monocytogenes in adverse environments and may also contribute to qualitative and quantitative underestimation of this important pathogen in food processing environments, with potential implications in public health.
Keywords: Listeria monocytogenes; Alkali; Shape; Sublethal stress

Anshuman A. Khardenavis, M. Suresh Kumar, Sandeep N. Mudliar, Tapan Chakrabarti, Biotechnological conversion of agro-industrial wastewaters into biodegradable plastic, poly [beta]-hydroxybutyrate, Bioresource Technology, Volume 98, Issue 18, December 2007, Pages 3579-3584, ISSN 0960-8524, DOI: 10.1016/j.biortech.2006.11.024.
(http://www.sciencedirect.com/science/article/B6V24-4MRNCMM-3/2/813cc4d070d2a49ced481f494779f5f5)
Abstract:
Waste activated sludge generated from a combined dairy and food processing industry wastewater treatment plant was evaluated for its potential to produce biodegradable plastic, poly [beta]-hydroxybutyric acid (PHB). Deproteinized jowar grain-based distillery spentwash yielded 42.3% PHB production (w/w), followed by filtered rice grain-based distillery spentwash (40% PHB) when used as substrates. Addition of di-ammonium hydrogen phosphate (DAHP) resulted in an increase in PHB production to 67% when raw rice grain-based spentwash was used. Same wastewater, after removal of suspended solids by filtration and with DAHP supplementation resulted in lower PHB production (57.9%). However, supplementing other wastes with DAHP led to a substantial decrease in PHB content in comparison to what was observed in the absence of DAHP.
Keywords: Biodegradable plastics; Poly [beta]-hydroxybutyric acid; Activated sludge; Industrial wastewaters; Biopolymers

Caroline Capitani, Oscar. E. Perez, Bertoldo Pacheco, Maria Teresa, Ana M.R. Pilosof, Influence of complexing carboxymethylcellulose on the thermostability and gelation of [alpha]-lactalbumin and [beta]-lactoglobulin, Food Hydrocolloids, Volume 21, Issue 8, December 2007, Pages 1344-1354, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.10.022.
(http://www.sciencedirect.com/science/article/B6VP9-4MKV2SD-1/2/295be23dfdf1241e37bed019b7fedb1f)
Abstract:
Thermostability and gelation of the main proteins of whey, [alpha]-lactalbumin ([alpha]-lac) and [beta]-lactoglobulin ([beta]-lg) recovered by selective complexation with carboxymethylcellulose (CMC) was studied to evaluate its functionality in food systems. Their behavior was compared to the non-complexed proteins. Both complexes showed a maximum stability at pH 4, that is close to the pH of obtention of [beta]-lg/CMC coacervate (pH 4) and [alpha]-lac/CMC coacervate (pH 3.2). Protein complexation increased the thermostability of [beta]-lg by approximately 6-8 [degree sign]C and that of [alpha]-lac by approximately 26 [degree sign]C due to immobilization of protein molecules in a complex, mainly by electrostatic interactions and because of different amounts of bound polysaccharide. The denaturation enthalpy of complexed proteins markedly decreased as compared to free proteins. Storage modulus (G') and loss modulus (G'') were recorded to reflect the structure development during heating [beta]-lg/CMC and [alpha]-lac/CMC complexes at different pH values. [beta]-lg/CMC complex at 20 wt% was a viscoelastic liquid at pH values within 2 and 8 but upon heating turned to a particulate viscoelastic gel. However, [alpha]-lac/CMC complex formed before heating opaque, large visible white particulate aggregates that sticked together to give a solid viscoelastic structure that was not further modified by thermal processing.
Keywords: Protein polysaccharide interactions; Differential scanning calorimetry; Denaturation; Gels; Coacervate

T. Skoglund, P. Dejmek, Fuzzy Traceability: A Process Simulation Derived Extension of the Traceability Concept in Continuous Food Processing, Food and Bioproducts Processing, Volume 85, Issue 4, December 2007, Pages 354-359, ISSN 0960-3085, DOI: 10.1205/fbp07044.
(http://www.sciencedirect.com/science/article/B8JGD-4S3RY69-2/2/1b6b1a4b82d54e4cfc4e37f239232a96)
Abstract:
Liquid food production often involves continuous processing. This leads to problems in traceability systems due to mixing zones and therefore indistinct batch identities causing difficulties with regard to withdrawals or recalls. This article outlines the possible use of the concept of dynamic simulation to improve the handling of batch identities in continuous production of liquid food, a concept we call fuzzy traceability. The concept is illustrated with a realistic example from a real dairy process line.
Keywords: traceability; internal traceability; fuzzy traceability; dynamic simulation; dispersed flow; continuous production; virtual batch; food safety

J.J. Fitzpatrick, Particle Properties and the Design of Solid Food Particle Processing Operations, Food and Bioproducts Processing, Volume 85, Issue 4, December 2007, Pages 308-314, ISSN 0960-3085, DOI: 10.1205/fbp07056.
(http://www.sciencedirect.com/science/article/B8JGD-4S3RY69-3/2/edef6249f05c0ae2d70cc7c9d9988d89)
Abstract:
Particle properties can have a major influence on the design and optimisation of particle production, handling and processing operations. This paper provides a selected number of examples of how particle properties influence the design and optimisation of food particle operations. These include the influence of particle size and how particle breakage influences size

during precipitation/crystallization processes and subsequent transport and particle separation; powder flow out of hoppers and silos; and the influence of glass transition on particle stickiness and how this affects the performance of a number of operations.
Keywords: food powders; particle properties; flowability; stickiness; glass transition

K. Cronin, D. Mackey, V. Cregan, S. O'Brien, J.P. Gleeson, K. Abodayeh, Selection of Processing Temperature to Minimize Product Temperature Variability in Food Heating Processes, Food and Bioproducts Processing, Volume 85, Issue 4, December 2007, Pages 344-353, ISSN 0960-3085, DOI: 10.1205/fbp07080.
(http://www.sciencedirect.com/science/article/B8JGD-4S3RY69-C/2/27d1b81c5238fdbb22486ac73435de94)
Abstract:
Random variability in product thermal properties combined with non-uniformity in the process environment can cause a distribution in product temperature at the end of a heating stage. This unwanted dispersion can affect the integrity and profitability of the operation. The dispersion can be quantified with the statistics of range, minimum or variance. This paper demonstrates how the magnitude of this dispersion is sensitive to the level of processing temperature that is employed. It explains and gives a criterion by which the process environment can be judged as being either uniform or non-uniform. Furthermore the paper demonstrates that using a certain processing time will minimize the variance in product temperature. Using a case study, involving the heat treatment of foods, the strategies that can be employed to control product temperature dispersion, through selection of the process temperature, are outlined.
Keywords: heat transfer; random variability; temperature dispersion; process optimization

A. Hartwig, A. Pelzer, D. Burnouf, H. Titeca, H. Delincee, K. Briviba, C. Soika, C. Hodapp, F. Raul, M. Miesch, D. Werner, P. Horvatovich, E. Marchioni, Toxicological potential of 2-alkylcyclobutanones - specific radiolytic products in irradiated fat-containing food - in bacteria and human cell lines, Food and Chemical Toxicology, Volume 45, Issue 12, December 2007, Pages 2581-2591, ISSN 0278-6915, DOI: 10.1016/j.fct.2007.05.033.
(http://www.sciencedirect.com/science/article/B6T6P-4P2S95K-2/2/d5dde1614bb9b84d36b3eae5cef8a2f3)
Abstract:
Food irradiation has been considered as a safe processing technology to improve food safety and preservation, eliminating efficiently bacterial pathogens, parasites and insects. This study aims to characterize the toxicological potential of 2-alkylcyclobutanones (2-ACBs), radiolytic derivatives of triglycerides, formed uniquely upon irradiation of fat-containing food. In irradiated food they are generated proportionally to fat content and absorbed radiation dose.
The cyto- and genotoxic potentials of various highly pure synthetic 2-ACBs were studied in bacteria and human cell lines. While pronounced cytotoxicity was evident in bacteria, no mutagenic activity has been revealed by the Ames test in Salmonella strains TA 97, TA 98 and TA 100. In mammalian cells genotoxicity was demonstrated mainly by the induction of DNA base lesions recognized by the Fpg protein as determined by both the Comet Assay and the Alkaline Unwinding procedure. Formation of DNA strand breaks was observed by the Alkaline Unwinding procedure but not by the Comet Assay. The extent of cytotoxicity and genotoxicity were dependent on chain length and degree of unsaturation of the fatty acid chain. Further studies will have to clarify mechanisms of action and potential relevance for human exposure situation.
Keywords: Food irradiation; 2-Alkylcyclobutanones; Cytotoxicity; Genotoxicity; Mutagenicity; Oxidative DNA lesions

Chrysoula C. Tassou, Polymnia Galiatsatou, Fotis J. Samaras, Constantinos G. Mallidis, Inactivation kinetics of a piezotolerant Staphylococcus aureus isolated from high-pressure-treated

sliced ham by high pressure in buffer and in a ham model system: Evaluation in selective and non-selective medium, Innovative Food Science & Emerging Technologies, Volume 8, Issue 4, High Pressure Processing Special Issue Section, December 2007, Pages 478-484, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.002.
(http://www.sciencedirect.com/science/article/B6W6D-4NGRRVN-1/2/8e4914d51a8c4feb28979670107b95d8)
Abstract:
The kinetics of inactivation by high pressure of a pressure-resistant strain of Staphylococcus aureus isolated from pressure-treated packaged sliced ham, in buffer and in a ham model system was studied. Selective (BP agar) and enrichment media (BHI agar) were used for enumeration in order to count healthy and sublethally injured cells of the pathogen. A first-order kinetic inactivation was observed in both suspension media, and a very significant increase in D values was apparent when the microorganism was suspended and pressurized in the model food system compared to buffer. In the case of phosphate buffer as suspension medium, the zp values obtained were 107.5 and 113.6 MPa for the two recovery media, i.e. BP and BHI agars, respectively. In contrast, in the case of the food model system, a two-phase linear relation was apparent and the PDT (Pressure Death Time) curve can be divided into two linear sections, so that two zp values could be defined, one for each section. Zp values of 100 and 79.4 MPa correspond to pressures < 500 MPa for the BP and BHI counts, respectively, while zp values of 416.7 and 333.3 MPa correspond to higher pressures > 500 MPa for the selective and non-selective medium, respectively. When S. aureus had been pressurized in phosphate buffer, the BHI agar was slightly better in cell recovery, while in the case of the ham model system, the BP agar proved superior and gave significantly higher colony counts.Industrial relevance
The paper provides significant information for the food processing industry as it deals with the effect of high-pressure technology on a piezotolerant pathogen that may survive in sliced ham. This technology is already applied in ham products and this paper supports the need for the use of real food in pressure studies in order to avoid underestimation of the effect and hence the processing times. It is also shown that different recovery media, i.e. selective and non-selective, should be used to avoid underestimation of the surviving cells.
Keywords: High pressure; Staphylococcus aureus; Ham; Meat products; Inactivation; Sublethal injury; Selective media

A. Mathys, B. Chapman, M. Bull, V. Heinz, D. Knorr, Flow cytometric assessment of Bacillus spore response to high pressure and heat, Innovative Food Science & Emerging Technologies, Volume 8, Issue 4, High Pressure Processing Special Issue Section, December 2007, Pages 519-527, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.06.010.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-1/2/5ee0209437251d567be679c0a729e4f1)
Abstract:
The physiological response of Bacillus licheniformis spores to high pressure and thermal inactivation in sodium citrate buffer and nutrient broth was investigated using multiparameter flow cytometry. Spores were treated by heat-only at 121 [degree sign]C, by high pressure at 150 MPa (37 [degree sign]C), or by a combined high pressure and heat treatment at 600 MPa and 77 [degree sign]C, and then dual stained with the fluorescent dyes SYTO 16 and propidium iodide (PI). For pressure treated spores, but not heat-only treated spores, four distinct sub-populations were detected by flow cytometry, and for these we suggest a three step model of inactivation involving a germination step following hydrolysis of the spore cortex, an unknown step, and finally an inactivation step with physical compromise of the spore's inner membrane.Industrial relevance
This preliminary study offers a simple and fast flow cytometric method for the rapid assessment of the physiological state of bacterial spores following high pressure and thermal processing. An improved understanding of the mechanisms of spore inactivation will aid in the food safety

assessment of pressure assisted thermal sterilisation in particular, and also assist in the commercialisation of these processes facilitating adoption by industry.
Keywords: Flow cytometry; High pressure; Spore germination; Spore inactivation

Eleen L.C. Goh, Ailsa D. Hocking, Cynthia M. Stewart, Ken A. Buckle, Graham H. Fleet, Baroprotective effect of increased solute concentrations on yeast and moulds during high pressure processing, Innovative Food Science & Emerging Technologies, Volume 8, Issue 4, High Pressure Processing Special Issue Section, December 2007, Pages 535-542, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.004.
(http://www.sciencedirect.com/science/article/B6W6D-4NJ20G6-1/2/7a8e89d00cb98c0a10f1557e46785a81)
Abstract:
The baroprotective effect of increasing solute concentrations on yeast cells and fungal conidia subjected to high pressure processing (HPP) was studied. Suspensions of yeast cells (Saccharomyces cerevisiae, Pichia anomala and Hanseniaspora uvarum) or fungal spores (Penicillium expansum, Fusarium oxysporum and Rhizopus stolonifer) in citrate phosphate buffer formulated with sucrose at 40, 50 and 60 [degree sign]Brix, or with glycerol and NaCl at equivalent water activity (aw) values (0.925, 0.903 and 0.866 aw) were subjected to 600 MPa pressure for varying times, and then were enumerated by spread plate technique to assess survival. There was an increasing resistance to inactivation by high pressure with an increase in solute concentration. The two moulds with easily wetted spores, R. stolonifer and F. oxysporum, showed strongest resistance to HPP at 0.866 aw. Differing responses to the three solutes were observed among the fungal species tested, indicating that the chemical nature of the solute may also be important in protecting yeasts and moulds during and after pressure treatment. Sucrose had a stronger baroprotective effect for S. cerevisiae than the other solutes, at two of the three investigated aws. For P. expansum at 0.903 aw, NaCl gave the best protective effect. Scanning electron microscopy of HPP treated cells showed the protective effects of increased sucrose concentration. The results reported here have practical implications for the food industry in the application of HPP for production of fruit preparations or syrups, and should be taken in account in establishing efficient process design.Industrial relevance
As high concentrations of sugar, salt and glycerol provide protection for yeasts and moulds during high pressure processing, foods containing high levels of solutes may need longer processing times or higher pressures to achieve inactivation of these fungi.
Keywords: High pressure; Yeast; Mould; Solute concentration; Sucrose; NaCl; Glycerol

Jennifer K. McInerney, Cathryn A. Seccafien, Cynthia M. Stewart, Anthony R. Bird, Effects of high pressure processing on antioxidant activity, and total carotenoid content and availability, in vegetables, Innovative Food Science & Emerging Technologies, Volume 8, Issue 4, High Pressure Processing Special Issue Section, December 2007, Pages 543-548, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.005.
(http://www.sciencedirect.com/science/article/B6W6D-4NJ7WBT-3/2/878b87d94cbcf5255727b207d23a30be)
Abstract:
High pressure processing (HPP) is a relatively new food preservation processing technology that enhances food safety and shelf-life without compromising organoleptic qualities. There has been little research on the impact of HPP on the nutritional and health-promoting properties of foods to date and most of it has focused on juices and purees of fruit such as oranges and tomatoes. The objective of this study was to determine the effects of HPP treatment at two pressure levels (400 MPa; 600 MPa) on antioxidant activity, total carotenoid content and carotenoid availability in vitro, of three commonly consumed vegetables. Antioxidant capacity and total carotenoid content differed between vegetables but were unaffected by HPP treatment. In vitro availability of specific

carotenoids also varied greatly between vegetables (3-35%). HPP altered availability of carotenoids according to the type of vegetable treated and processing pressure applied, however the magnitude of the responses was minor.Industrial relevance
This study provides further scientific evidence of the benefits of high pressure processing in retaining the nutritional attributes of fresh foods. Antioxidant activity and levels of carotenoids before and after exposure to high pressures (up to 600 MPa for 2 min) were essentially no different. Also, the data suggest that micronutrients and phytochemicals in certain vegetables may be made more bioavailable by high pressure treatment. From a nutritional perspective, high pressure processing is an attractive food preservation technology and clearly offers opportunities for horticultural and food processing industries to meet the growing demand from consumers for healthier food products.
Keywords: High pressure processing; Antioxidant capacity; Carotenoids; Lutein; Vegetables

Fanbin Kong, Juming Tang, Barbara Rasco, Chuck Crapo, Kinetics of salmon quality changes during thermal processing, Journal of Food Engineering, Volume 83, Issue 4, December 2007, Pages 510-520, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.04.002.
(http://www.sciencedirect.com/science/article/B6T8J-4NGRRMJ-5/2/ff3a76a61abf405660ba26bc300b91ef)
Abstract:
The kinetics of reactions leading to changes in salmon quality during thermal processing were evaluated. Small samples (D 30 mm x H 6 mm) cut from pink salmon (Oncorhynchus gorbuscha) fillets were sealed in aluminum containers (internal dimension: D 35 mm x H 6 mm) and heated in an oil bath at 100, 111.1, 121.1, and 131.1 [degree sign]C for different time intervals up to 180, 150, 120, 90 min, respectively. A fractional conversion model was used to describe the increase in cook loss during heating; and a quadratic relationship to correlate cook loss with area shrinkage ratio. Color changes (CIE L*, b* and [Delta]E) involved whitening and browning phases. In the browning phase, the changes of CIE L*, b* and [Delta]E followed a zero-order reaction. The progressive change of texture with time as indicated by shear force during heating went through four different phases, and the second (rapid tenderizing) and third phases (slow toughening) were modeled using a first-order reaction kinetic model. The decay of thiamin during heating was modeled with two different relationships: a second-order reaction in which the temperature dependence of the rate constant followed an Arrhenius relationship; and a Weibull-log logistic model recently proposed.
Keywords: Pink salmon; Food thermal process; Quality changes; Kinetics; Shear force; Cook loss; Area shrinkage; Color; Thiamin

M. Rodriguez-Fernandez, E. Balsa-Canto, J.A. Egea, J.R. Banga, Identifiability and robust parameter estimation in food process modeling: Application to a drying model, Journal of Food Engineering, Volume 83, Issue 3, December 2007, Pages 374-383, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.03.023.
(http://www.sciencedirect.com/science/article/B6T8J-4NB997T-1/2/543cc65ceb8eb09fcdac22cf9323283a)
Abstract:
Model based methods are fundamental in modern food process engineering. The most realistic models combine the physical laws of conservation and constitutive relations associated with kinetic transformations and physical properties, which usually depend on non-measurable parameters. Therefore, a crucial step in model development is model calibration, that is, the computation of those parameters based on experimental data.
In this contribution, a two-step approach for proper model calibration is proposed. The first step, usually disregarded, consists of performing a structural identifiability analysis to evaluate the (im-)possibility of giving unique solutions for the model parameters. The second step consists of using

robust parameter estimation techniques, based on global optimization methods as the alternative to surmount the convergence to sub-optimal solutions which may lead to wrong conclusions about model predictive capabilities.
A typical model for food air-drying is presented as a case study in order to highlight usual difficulties associated with the calibration of food processing models, and how the proposed two-step procedure can help modelers to overcome such difficulties.
Keywords: Drying; Food processing; Global optimization; Identifiability; Model calibration; Parameter estimation

Valerie Lechevalier, Romain Jeantet, Abdellah Arhaliass, Jack Legrand, Francoise Nau, Egg white drying: Influence of industrial processing steps on protein structure and functionalities, Journal of Food Engineering, Volume 83, Issue 3, December 2007, Pages 404-413, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.03.033.
(http://www.sciencedirect.com/science/article/B6T8J-4NCSGG8-1/2/1471d5ba0175bdedc85b348e974c5d91)
Abstract:
Spray-dried egg white is commonly used as a food ingredient for its foaming and gelling properties. However, these properties are obtained thanks to dry-heating of egg white powder, which is necessary to offset the harmful effects of spray-drying process on egg white functionality. The purpose of the present work is to identify the processing steps responsible for the damages to egg white functional properties, and to understand the mechanisms that occur in order to limit these effects and to reduce dry-heating time. Two trials were performed and the measurements of egg white protein conformation and gel firmness were significantly different from one trial to another, thus emphasizing great variations in raw material characteristics. In spite of this trial effect, processing steps significantly modified egg white foaming properties. The most critical step was the spray-drying one that strongly damaged foaming properties. During this step, heat transfers and air-product interface area rather than shear rates were responsible for these changes. Then, it was the pumping and filtering steps that had also a considerable effect, due to the generation of shear rates and stainless steel-product interfaces, responsible for foaming property damages. On the other hand, concentration and desugarization steps had an interesting improving effect on egg white foaming properties.
Keywords: Egg white; Foam; Gel; Protein structure; Spray drying; Heating; Shearing; Interface

Aurora Zugarramurdi, Maria A. Parin, Liliana Gadaleta, Hector M. Lupin, A quality cost model for food processing plants, Journal of Food Engineering, Volume 83, Issue 3, December 2007, Pages 414-421, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.03.029.
(http://www.sciencedirect.com/science/article/B6T8J-4NC4M5G-1/2/e2cd2a1b430d15754f3b45b1cac8c6c2)
Abstract:
A HACCP-based system is a recognized food safety management program aiming at the control of all the factors affecting food safety. It is also possible to add factors related to food quality. To evaluate the effectiveness of a quality system, a realistic estimate of quality costs is essential. The purpose of this work is to develop a mathematical model for the calculation of the costs associated with a specific quality level due to HACCP-based system implementation. Experimental results obtained at Argentinean hake freezing plants (Merluccius hubbsi) are presented and compared with those calculated with the proposed model. The proportion of variance explained by the model was 0.903 for total quality costs; proving its optimum performance.
Keywords: HACCP; Quality costs; Food; Fish freezing plant

Raghupathy Ramaswamy, V.M. Balasubramaniam, S.K. Sastry, Thermal conductivity of selected liquid foods at elevated pressures up to 700 MPa, Journal of Food Engineering, Volume 83, Issue 3, December 2007, Pages 444-451, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.04.006.
(http://www.sciencedirect.com/science/article/B6T8J-4NGRRMJ-1/2/010c8d455da451cc9fc68325562e209c)
Abstract:
Thermal conductivity (k) of selected liquid foods during high- pressure processing (HPP) was studied using a line heat source probe. The probe was calibrated using distilled water and probe specific calibration factors were developed by comparing experimental data against published data from National Institute of Standards and Technology (NIST) for water. k of commercially available apple juice, canola oil, clarified butter, honey and high fructose corn syrup (HFCS) were then determined using a custom made high pressure experimental setup for various pressures (0.1, 100, 300, 500 and 700 MPa) at 25 [degree sign]C. Results indicated that material k increased linearly with increasing pressures up to 700 MPa. Water and water-like substances (apple juice) were found to have the highest k values (up to 0.82 W/m [degree sign]C at 700 MPa), while fatty foods such as canola oil and clarified butter had the lowest (0.29-0.4 W/m [degree sign]C, respectively at 700 MPa) values. Honey and HFCS had intermediate values. The combined uncertainty (including Type A and Type B) in the measurement of k values of various liquid foods ranged from 0.6% (canola oil) to 3.8% (HFCS).
Keywords: High-pressure processing; Thermal conductivity; Line-heat source probe; Liquid foods

A. Robert Marselles-Fontanet, Olga Martin-Belloso, Optimization and validation of PEF processing conditions to inactivate oxidative enzymes of grape juice, Journal of Food Engineering, Volume 83, Issue 3, December 2007, Pages 452-462, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.04.001.
(http://www.sciencedirect.com/science/article/B6T8J-4NGRRMJ-2/2/a67777fc0acf090ff4a1233aba5215e8)
Abstract:
White grape juice was processed using high intensity pulsed electric fields (PEF). The effect of this preservative technology on polyphenoloxidase (PPO) and peroxidase (POD) as well as on refractometric index, sugar content, pH, acidity and density was studied. In addition, the use of the response surface methodology as a tool to obtain accurate information and provide predictions of enzymatic depletion on real foods was assessed.
The studied PEF factors were electric field strength, pulse frequency, pulse width and total treatment time. Inactivation values of 100% for PPO and up to 50% for POD were achieved after different PEF treatments. The activity depletion was strongly dependent on the evaluated factors, mainly PEF treatment time. A predictive equation for each residual activity covering the whole range of experimentation was developed and their results were confirmed against a set of validation experiments. In addition, predictions obtained from the developed response surfaces and exponential kinetic models were comparable.
In conclusion, PEF treatments depleted PPO and POD activities of grape juice although it was observed that grape POD was less sensible than PPO to PEF technology. Response surface methodology allows analysing and optimizing the PEF treatments as well as predicting their results with very few experiments.
Keywords: Pulsed electric field technology; Grape juice; Enzymatic activity; Response surface methodology; Mathematical models

Reuven Yeshurun, Guy Bar-Oz, Mina Weinstein-Evron, Modern hunting behavior in the early Middle Paleolithic: Faunal remains from Misliya Cave, Mount Carmel, Israel, Journal of Human Evolution, Volume 53, Issue 6, December 2007, Pages 656-677, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2007.05.008.

(http://www.sciencedirect.com/science/article/B6WJS-4PB160B-1/2/278649951bff2dce80bef977835676e4)
Abstract:
Understanding the behavioral adaptations and subsistence strategies of Middle Paleolithic humans is critical in the debate over the evolution and manifestations of modern human behavior. The study of faunal remains plays a central role in this context. Until now, the majority of Levantine archaeofaunal evidence was derived from late Middle Paleolithic sites. The discovery of faunal remains from Misliya Cave, Mount Carmel, Israel (>200 ka), allowed for detailed taphonomic and zooarchaeological analyses of these early Middle Paleolithic remains. The Misliya Cave faunal assemblage is overwhelmingly dominated by ungulate taxa. The most common prey species is the Mesopotamian fallow deer (Dama mesopotamica), followed closely by the mountain gazelle (Gazella gazella). Some aurochs (Bos primigenius) remains are also present. Small-game species are rare. The fallow deer mortality pattern is dominated by prime-aged individuals. A multivariate taphonomic analysis demonstrates (1) that the assemblage was created solely by humans occupying the cave and was primarily modified by their food-processing activities; and (2) that gazelle carcasses were transported complete to the site, while fallow deer carcasses underwent some field butchery. The new zooarchaeological data from Misliya Cave, particularly the abundance of meat-bearing limb bones displaying filleting cut marks and the acquisition of prime-age prey, demonstrate that early Middle Paleolithic people possessed developed hunting capabilities. Thus, modern large-game hunting, carcass transport, and meat-processing behaviors were already established in the Levant in the early Middle Paleolithic, more than 200 ka ago.
Keywords: Middle Paleolithic; Middle Pleistocene; Taphonomy; Zooarchaeology; Levant; Hunting; Multivariate taphonomic approach; Skeletal-element transport

S. Balasubramanian, S. Panigrahi, B. Kottapalli, C.E. Wolf-Hall, Evaluation of an artificial olfactory system for grain quality discrimination, LWT - Food Science and Technology, Volume 40, Issue 10, December 2007, Pages 1815-1825, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.12.016.
(http://www.sciencedirect.com/science/article/B6WMV-4MYMG3F-1/2/4d73267f70e64912eabfaf435ceea3db)
Abstract:
A commercially available Cyranose-320(TM) conducting polymer-based electronic nose system was used to analyze the headspace from stored barley samples. Three types of barley samples were analyzed, namely, clean barley, naturally Fusarium infected barley and Fusarium inoculated clean barley. The barley samples were stored at moisture contents of 13, 18, 20 and 25 g of water/100 g sample. The raw signals obtained from the electronic nose system were pre-processed by various signal-processing techniques to extract area-based features. Principal component analysis was subsequently performed on the processed signals to further reduce the dimensionalities. Classification models using linear (LDA) and quadratic discriminant analyses (QDA) were developed using the extracted features. The performance of the developed models was validated using leave-1-out cross validation and bootstrapping method. The models classified the barley samples stored into two groups based on the ergosterol content, i.e., 'acceptable' (ergosterol content <3.0 [mu]g/g) and 'unacceptable' (ergosterol content [greater-or-equal, slanted]3.0 [mu]g/g). Overall, the total maximum classification accuracy obtained was 86.8% by both LDA and QDA when leave-1-out cross-validation was used. By bootstrapping validation the maximum total classification accuracy obtained was 86.4% and 86.1% respectively, by QDA and LDA. The study proves that there is potential in using an electronic nose system for indicating mold spoilage in stored grains, and necessitates future studies in this direction.
Keywords: Food safety; Ergosterol; Barley; Grain storage; Electronic nose; Intelligent sensors

A.A. Gowen, C.P. O'Donnell, P.J. Cullen, G. Downey, J.M. Frias, Hyperspectral imaging - an emerging process analytical tool for food quality and safety control, Trends in Food Science &

Technology, Volume 18, Issue 12, December 2007, Pages 590-598, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.06.001.
(http://www.sciencedirect.com/science/article/B6VHY-4P2YWM4-1/2/9b4f196a2b38443d08f727c3c4ed9633)
Abstract:
Hyperspectral imaging (HSI) is an emerging platform technology that integrates conventional imaging and spectroscopy to attain both spatial and spectral information from an object. Although HSI was originally developed for remote sensing, it has recently emerged as a powerful process analytical tool for non-destructive food analysis. This paper provides an introduction to hyperspectral imaging: HSI equipment, image acquisition and processing are described; current limitations and likely future applications are discussed. In addition, recent advances in the application of HSI to food safety and quality assessment are reviewed, such as contaminant detection, defect identification, constituent analysis and quality evaluation.

Marta Corzo-Martinez, Nieves Corzo, Mar Villamiel, Biological properties of onions and garlic, Trends in Food Science & Technology, Volume 18, Issue 12, December 2007, Pages 609-625, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.07.011.
(http://www.sciencedirect.com/science/article/B6VHY-4PB6VTS-1/2/4135e2ff6723d32f05464e45b44ca77d)
Abstract:
Garlic (Allium sativum) and onion (Allium cepa) are two food ingredients widely used in our gastronomy. Moreover, garlic and onion extracts have been recently reported to be effective in cardiovascular disease, because of their hypocholesterolemic, hypolipidemic, anti-hypertensive, anti-diabetic, antithrombotic and anti-hyperhomocysteinemia effects, and to possess many other biological activities including antimicrobial, antioxidant, anticarcinogenic, antimutagenic, antiasthmatic, immunomodulatory and prebiotic activities. Given the importance of these vegetables and derived supplements as much in feeding as in therapeutic, in the present work, their main biological activities have been reviewed, indicating the compounds responsible for each one of them. In addition, the influence of the processing on the bioactivity and the adverse effects and interactions with different medications have also been considered.

Christine E.R. Dodd, Philip J. Richards, Timothy G. Aldsworth, Suicide through stress: A bacterial response to sub-lethal injury in the food environment, International Journal of Food Microbiology, Volume 120, Issues 1-2, 20th International ICFMH Symposium on FOOD MICRO 2006, 30 November 2007, Pages 46-50, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.06.008.
(http://www.sciencedirect.com/science/article/B6T7K-4NYJ0KH-M/2/68fa46f4bdc353d9abf905ac5e61a305)
Abstract:
The response of bacteria to sub-lethal injury is an important aspect of food microbiology as many inimical processes to which bacteria are subjected during processing are non-lethal. For pathogens like Salmonella and Escherichia coli, the difference in injury levels of exponential phase cells compared to their stationary phase counterparts in this regard is well recognised and evident for a variety of inimical processes. The expression of a range of stress resistance genes under the control of the sigma factor RpoS provides some explanation for the greater resistance of stationary phase cells. However in 1997 the suicide response hypothesis was put forward as an explanation for the observed response of Salmonella and E. coli to sub-lethal stresses. This hypothesis arose as an explanation for the observed protection of Salmonella and E. coli strains to heat and freeze-thaw injury by the presence of a high level of competitor organisms, a protection that had been shown to be RpoS independent. The central tenet of this theory was that under sub-lethal stress bacteria produce a burst of intracellular free radicals and it is these that lead to sub-lethal injury and/or death. Exponential phase cells because of their more active metabolism are more

susceptible to this effect and suffer greater damage. This paper reviews the origins of this theory, the evidence for a free radical response and explores the potential mechanisms by which competitor cells produce a protective effect.
Keywords: RpoS; Stationary phase; Sub-lethal injury; Free radicals; Suicide response

Antonio Galvez, Hikmate Abriouel, Rosario Lucas Lopez, Nabil Ben Omar, Bacteriocin-based strategies for food biopreservation, International Journal of Food Microbiology, Volume 120, Issues 1-2, 20th International ICFMH Symposium on FOOD MICRO 2006, 30 November 2007, Pages 51-70, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.06.001.
(http://www.sciencedirect.com/science/article/B6T7K-4NYD8J0-2/2/58754b30002effc4202742676ce33355)
Abstract:
Bacteriocins are ribosomally-synthesized peptides or proteins with antimicrobial activity, produced by different groups of bacteria. Many lactic acid bacteria (LAB) produce bacteriocins with rather broad spectra of inhibition. Several LAB bacteriocins offer potential applications in food preservation, and the use of bacteriocins in the food industry can help to reduce the addition of chemical preservatives as well as the intensity of heat treatments, resulting in foods which are more naturally preserved and richer in organoleptic and nutritional properties. This can be an alternative to satisfy the increasing consumers demands for safe, fresh-tasting, ready-to-eat, minimally-processed foods and also to develop 'novel' food products (e.g. less acidic, or with a lower salt content). In addition to the available commercial preparations of nisin and pediocin PA-1/AcH, other bacteriocins (like for example lacticin 3147, enterocin AS-48 or variacin) also offer promising perspectives. Broad-spectrum bacteriocins present potential wider uses, while narrow-spectrum bacteriocins can be used more specifically to selectively inhibit certain high-risk bacteria in foods like Listeria monocytogenes without affecting harmless microbiota. Bacteriocins can be added to foods in the form of concentrated preparations as food preservatives, shelf-life extenders, additives or ingredients, or they can be produced in situ by bacteriocinogenic starters, adjunct or protective cultures. Immobilized bacteriocins can also find application for development of bioactive food packaging. In recent years, application of bacteriocins as part of hurdle technology has gained great attention. Several bacteriocins show additive or synergistic effects when used in combination with other antimicrobial agents, including chemical preservatives, natural phenolic compounds, as well as other antimicrobial proteins. This, as well as the combined use of different bacteriocins may also be an attractive approach to avoid development of resistant strains. The combination of bacteriocins and physical treatments like high pressure processing or pulsed electric fields also offer good opportunities for more effective preservation of foods, providing an additional barrier to more refractile forms like bacterial endospores as well. The effectiveness of bacteriocins is often dictated by environmental factors like pH, temperature, food composition and structure, as well as the food microbiota. Foods must be considered as complex ecosystems in which microbial interactions may have a great influence on the microbial balance and proliferation of beneficial or harmful bacteria. Recent developments in molecular microbial ecology can help to better understand the global effects of bacteriocins in food ecosystems, and the study of bacterial genomes may reveal new sources of bacteriocins.
Keywords: Bacteriocin; Biopreservation; Hurdle technology; Lactic acid bacteria; Food

S.J.C.M. Oomes, A.C.M. van Zuijlen, J.O. Hehenkamp, H. Witsenboer, J.M.B.M. van der Vossen, S. Brul, The characterisation of Bacillus spores occurring in the manufacturing of (low acid) canned products, International Journal of Food Microbiology, Volume 120, Issues 1-2, 20th International ICFMH Symposium on FOOD MICRO 2006, 30 November 2007, Pages 85-94, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.06.013.
(http://www.sciencedirect.com/science/article/B6T7K-4NYJ0KH-6/2/63e6ae45081dd70ddd8ffc620d8f694c)

Abstract:
Spore-forming bacteria can be a problem in the food industry, especially in the canning industry. Spores present in ingredients or present in the processing environment severely challenge the preservation process since their thermal resistance may be very high. We therefore asked the question which bacterial spore formers are found in a typical soup manufacturing plant, where they originate from and what the thermal resistance of their spores is. To answer these questions molecular techniques for bacterial species and strain identification were used as well as a protocol for the assessment of spore heat stress resistance based on the Kooiman method. The data indicate the existence and physiological cause of the high thermal resistance of spores of many of the occurring species. In particular it shows that ingredients used in soup manufacturing are a rich source of high thermal resistant spores and that sporulation in the presence of ingredients rich in divalent metal ions exerts a strong influence on spore heat resistance. It was also indicated that Bacillus spores may well be able to germinate and resporulate during manufacturing i.e. through growth and sporulation in line. Both these spores and those originating from the ingredients were able to survive certain thermal processing settings. Species identity was confirmed using fatty acid analysis, 16SrRNA gene sequencing and DNA-DNA hybridisation. Finally, molecular typing experiments using Ribotyping and AFLP(R) analysis show that strains within the various Bacillus species can be clustered according to the thermal resistance properties of their spores. AFLP(R) performed slightly better than Ribotyping. The data proofed to be useful for the generation of strain specific probes. Protocols to validate these probes in routine identification and innovation aimed at tailor made heat processing in soup manufacturing have been formulated.
Keywords: Food processing; Spore heat resistance; Molecular phylogenetic characterisation; Cluster analysis

Luca Cocolin, Ana Diez, Rosalinda Urso, Kalliopi Rantsiou, Giuseppe Comi, Ingrid Bergmaier, Claudia Beimfohr, Optimization of conditions for profiling bacterial populations in food by culture-independent methods, International Journal of Food Microbiology, Volume 120, Issues 1-2, 20th International ICFMH Symposium on FOOD MICRO 2006, 30 November 2007, Pages 100-109, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.06.015.
(http://www.sciencedirect.com/science/article/B6T7K-4NYJ0KH-7/2/82c41e714f72d13a3c5a1b7d614e99c5)
Abstract:
In this study we used culture-independent methods to profile bacterial populations in food products. Denaturing gradient gel electrophoresis (DGGE) and fluorescence in situ hybridization (FISH) were employed in order to identify bacterial species without the need of isolation and biochemical identification. The protocols used to extract the DNA, subsequently subjected to PCR amplification for DGGE, as well as the hybridization procedure for FISH, were optimised. Moreover, an extensive study on the primers and probes to be used for the direct detection and identification of microorganisms commonly found in food, was carried out. Meat and cheese samples, fresh or processed, were subjected to DGGE and FISH analysis and the results obtained highlighted how the processing in food industry is decreasing the bacterial biodiversity. Not only processed cheese or meat but also fermented products were dominated by only one or few species. Lactobacillus sakei, Lactobacillus curvatus and Brochothrix thermosphacta were the main species found in meat products, while in cheese(s) Lactococcus lactis, Streptococcus thermophilus and Leuconostoc spp. were repeatedly detected. The results obtained by the two culture-independent methods used always correlated well.
Keywords: DGGE; FISH; Bacterial ecology; Culture-independent methods

Fabio Stagnari, Vincenzo Di Bitetto, Michele Pisante, Effects of N fertilizers and rates on yield, safety and nutrients in processing spinach genotypes, Scientia Horticulturae, Volume 114, Issue 4, 20 November 2007, Pages 225-233, ISSN 0304-4238, DOI: 10.1016/j.scienta.2007.06.016.

(http://www.sciencedirect.com/science/article/B6TC3-4P8H8KC-1/2/66bd39975e02881c38f630400bd05818)
Abstract:
Two field experiments were carried out at the Experimental Field, Department of Food Science (TE, Italy) in 2004 and 2005 to evaluate the effects of genotypes, different N forms and N rates on yield, safety and nutritional features of processing spinach. Experiment 1, as treatments, included spinach genotypes and N forms (CO(NH2)2; Agricote; NH4NO3); experiment 2 included three N forms (Ca(NO3)2; (NH4)2SO4; NH4NO3) applied at rates of 0, 75, 150, 200 kg N ha-1. This research work confirmed differences among spinach genotypes in terms of efficiency in N use and oxalate and nitrate accumulation. Spinach accumulated much more nitrate in petioles and much more oxalate in blades indicating that nitrate and oxalate might play a counterrole to each other. Fertilizers containing N under forms not readily available to the crop, i.e. Agricote, CO(NH2)2 and (NH4)2SO4, increased nitrate and oxalate accumulations less than fast N-release fertilizers, but their effect on yield was limited. Highest yield with contents of nitrate and oxalate lower than the limits imposed to avoid health problems, were achieved with Ca(NO3)2, at rates of 130 and 150 kg N ha-1 NH4NO3.
A good accumulation in some important macronutrients for the human diet such as Ca, K and P were allowed by application of Ca(NO3)2, at rates of 130 and 150 kg N ha-1 NH4NO3. The glucose, fructose, sucrose as well as Mg accumulation were not alterable in spinach with nitrogen fertilization or with genotype choice.
Keywords: Spinach; Nitrates; Oxalates; Nutrients; N fertilizers

Filip J.R. Meysman, Stijn Bruers, A thermodynamic perspective on food webs: Quantifying entropy production within detrital-based ecosystems, Journal of Theoretical Biology, Volume 249, Issue 1, 7 November 2007, Pages 124-139, ISSN 0022-5193, DOI: 10.1016/j.jtbi.2007.07.015.
(http://www.sciencedirect.com/science/article/B6WMD-4P7FSN9-4/2/3ab99a3085636add38bf1744954cf5b1)
Abstract:
Because ecosystems fit so nicely the framework of a 'dissipative system', a better integration of thermodynamic and ecological perspectives could benefit the quantitative analysis of ecosystems. One obstacle is that traditional food web models are solely based upon the principles of mass and energy conservation, while the theory of non-equilibrium thermodynamics principally focuses on the concept of entropy. To properly cast classical food web models within a thermodynamic framework, one requires a proper quantification of the entropy production that accompanies resource processing of the food web. Here we present such a procedure, which emphasizes a rigorous definition of thermodynamic concepts (e.g. thermodynamic gradient, disequilibrium distance, entropy production, physical environment) and their correct translation into ecological terms. Our analysis provides a generic way to assess the thermodynamic operation of a food web: all information on resource processing is condensed into a single resource processing constant. By varying this constant, one can investigate the range of possible food web behavior within a given fixed physical environment. To illustrate the concepts and methods, we apply our analysis to a very simple example ecosystem: the detrital-based food web of marine sediments. We examine whether entropy production maximization has any ecological relevance in terms of food web functioning.
Keywords: Non-equilibrium thermodynamics; Ecology; Modeling; Dissipation; Ecosystem

Julie Morand-Ferron, Louis Lefebvre, Flexible expression of a food-processing behaviour: Determinants of dunking rates in wild Carib grackles of Barbados, Behavioural Processes, Volume 76, Issue 3, November 2007, Pages 218-221, ISSN 0376-6357, DOI: 10.1016/j.beproc.2007.05.005.

(http://www.sciencedirect.com/science/article/B6T2J-4NSMMP8-1/2/8315238d7cf1b80c01cf669f62bd77ee)
Abstract:
Dunking, the softening of dry food in water to speed up consumption time, is normally a very rare behaviour in wild Carib grackles (Quiscalus lugubris) of Barbados. Its frequency can be experimentally increased when large numbers of dry items are repeatedly placed near a standing source of water in conditions that minimize intraspecific competition and risk of theft. To reconcile the normally low frequency of the behaviour in the wild with the high rates obtained in previous experiments, we tested three conditions where dunking varied between 0 and 70%. Dunking was very rare when it had been made unnecessary by pre-soaking the food, water was far from the dry items offered and only one food item was given, focusing all competitive interactions and theft attempts on a single individual. In contrast, dunking rate was high when food was not pre-soaked, water was close to dry food and more than one item (and hence target for competition and theft) was given. These experiments confirm that dunking rates, like other proto-tool-like food-processing techniques, depend on the costs and benefits of the situation where they are used.
Keywords: Behavioural flexiblity; Dunking behaviour; Food-processing; Quiscalus lugubris; Tool-use

Gary C. Matteson, B.M. Jenkins, Food and processing residues in California: Resource assessment and potential for power generation, Bioresource Technology, Volume 98, Issue 16, November 2007, Pages 3098-3105, ISSN 0960-8524, DOI: 10.1016/j.biortech.2006.10.031.
(http://www.sciencedirect.com/science/article/B6V24-4MY6N20-2/2/9fd1ddfdb1f08e33170a08694fae74df)
Abstract:
The California agricultural industry produces more than 350 commodities with a combined yearly value in excess of $28 billion. The processing of many of these crops results in the production of residue streams, and the food processing industry faces increasing regulatory pressure to reduce environmental impacts and provide for sustainable management and use. Surveys of food and other processing and waste management sectors combined with published state data yield a total resource in excess of 4 million metric tons of dry matter, with nearly half of this likely to be available for utilization. About two-thirds of the available resource is produced as high-moisture residues that could support 134 MWe of power generation by anaerobic digestion and other conversion techniques. The other third is generated as low-moisture materials, many of which are already employed as fuel in direct combustion biomass power plants. The cost of energy conversion remains high for biochemical systems, with tipping or disposal fees of the order of $30-50 Mg-1 required to align power costs with current market prices. Identifying ways to reduce capital and operating costs of energy conversion, extending operating seasons to increase capacity factors through centralizing facilities, combining resource streams, and monetizing environmental benefits remain important goals for restructuring food and processing waste management in the state.
Keywords: Biomass; Bioenergy; Anaerobic; Thermochemical; Food

Udith Jayasinghe-Mudalige, Spencer Henson, Identifying economic incentives for Canadian red meat and poultry processing enterprises to adopt enhanced food safety controls, Food Control, Volume 18, Issue 11, November 2007, Pages 1363-1371, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.08.010.
(http://www.sciencedirect.com/science/article/B6T6S-4M93P5B-1/2/90bbcfcaf7e0ca741b8348c645efd7d4)
Abstract:
This article presents the results of stage-one of a two-stage program of research study to identify the factors motivating adoption of enhanced food safety controls in the red meat and poultry

processing enterprises in Canada. The results are reported in the form of illustrative quotations drawn from the in-depth interviews (n = 34) with food safety and quality assurance managers of these firms operate in Ontario. It highlights that decisions at the level of the firm are complex and motivated by a number of market-based, regulatory and liability incentives, and the impact of each incentive on the adoption of food safety controls highly depend on the characteristics of the firm and the market where it operate in. It emphasizes the importance of adopting an 'incentive-based regulatory approach' in the Canadian food processing industry.
Keywords: Economic incentives; Food safety controls; Red meat and poultry processing sector

E. Domenech, I. Escriche, S. Martorell, Quantification of risks to consumers' health and to company's incomes due to failures in food safety, Food Control, Volume 18, Issue 11, November 2007, Pages 1419-1427, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.10.005.
(http://www.sciencedirect.com/science/article/B6T6S-4MG6P5C-1/2/c4d4e47e8b3d1be9675d6d5a7d71c208)
Abstract:
Quality assurance systems are required at each step in the food production chain to ensure safety of food and to show compliance with regulatory and customer requirements. This is a matter affecting food companies too as part of the business activity and a challenge since they are the main beneficiary, i.e. economically, when it offers a safe product and the worst affected otherwise. Thus, failures in food safety endanger not only consumers' health but also put at risk the company's profitability. This paper introduces the fundamentals and an example of application of the use of quantitative risk assessment (QRA) to estimate the risk to consumers' health and the induced company's economic losses, which can be of great support for the risk-informed decision-making in the food processing context. The information provided by the QRA could be used in this food industry context to prioritize the safety management measures needed according to real importance of the main hazards identified for a particular food processing, which simultaneously would better protect the consumer's health and be cost effective and efficient for the food industry. The example of application of this QRA on Listeria monocytogenes in raw fish shows that the risk for consumers' health imposed by the product of this company ranges normal values as compared with the survey in FDA/USDA and the risk for the company due to induced economic losses stays low in average, although an upper bound for such losses over a year period has been found significant due to both direct and indirect costs.
Keywords: Food quality; Food safety; Quantitative risk assessment; Farm to fork

Wisdom Kofi Amoa-Awua, Phyllis Ngunjiri, John Anlobe, Kafui Kpodo, Mary Halm, Alice Ewurafua Hayford, Mogens Jakobsen, The effect of applying GMP and HACCP to traditional food processing at a semi-commercial kenkey production plant in Ghana, Food Control, Volume 18, Issue 11, November 2007, Pages 1449-1457, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.10.009.
(http://www.sciencedirect.com/science/article/B6T6S-4MY6N2G-1/2/3611eaa4d6f725c4c44f994243ac7bd7)
Abstract:
To manage the hazards, aflatoxins and enteric pathogens, associated with the production of an indigenous African fermented maize product, kenkey, HACCP was implemented at a semi-commercial kenkey production plant in Accra. As a prerequisite programme, the facility was upgraded and GMP implemented before HACCP. The effectiveness of GMP and HACCP was assessed by monitoring the environment and kenkey production, as well as the auditing and verification of HACCP. Air sampling and swapping of equipment surfaces revealed a microbiota which was consistent with the fermented product. Monitoring showed that the raw materials, products, processing parameters, etc, conformed to the critical limits within which the safety of the food product would be ensured. This was confirmed by the results of laboratory analysis of raw materials, intermediary and final products. Escherichia coli, Staphylococcus aureus, Enterococcus,

Salmonella, Bacillus cereus, and Vibro cholera were not detected in any of the finished products and the level of total aflatoxins in the kenkey samples were between 17.2 and 14.5 [mu]g/kg. Levels of aflatoxins in kenkey samples reported at the plant before implementation of GMP and HACCP were between 64.1 and 196 [mu]g/kg. Application of GMP and HACCP was therefore found to be effective as a quality management system for assuring the safety of kenkey in the traditional processing of maize into kenkey.
Keywords: HACCP; GMP; Kenkey; Aflatoxins; Traditional food processing

Shigenobu Koseki, Yasuko Mizuno, Kazutaka Yamamoto, Predictive modelling of the recovery of Listeria monocytogenes on sliced cooked ham after high pressure processing, International Journal of Food Microbiology, Volume 119, Issue 3, 1 November 2007, Pages 300-307, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.08.025.
(http://www.sciencedirect.com/science/article/B6T7K-4PJ04PS-2/2/14d4039e012aece09ec1035ea2b6926c)
Abstract:
This study examined bacterial recovery on sliced cooked ham that was inoculated with Listeria monocytogenes, treated by high pressure processing (HPP) and then stored at 10 [degree sign]C for 70 days. The number of L. monocytogenes on the ham inoculated with 5 log10 CFU/g was initially reduced by HPP at 500 MPa for 10 min to below the detectable level (10 CFU/g). However, the bacterial count gradually increased during storage, and exceeded the initial inoculum level at the end of the 70-day period, having risen by 7-8 log10 CFU/g. A novel predictive model was therefore developed to estimate the recovery of L. monocytogenes during storage after HPP. Recovery of L. monocytogenes was defined as the detection of > 102 CFU/g bacteria, in view of the relevant food safety objectives of L. monocytogenes. At each 14-day sampling session, the ham was scored as either 1 or 0 indicating bacterial recovery or no bacterial recovery, respectively. The data were then subjected to a simple linear logistic regression model, which provided a good fit as indicated by the performance statistics. Using this model, we estimated the minimum HPP conditions necessary for the required storage periods. Additionally, as the developed model was based on logistic regression, the probability of the recovery of L. monocytogenes during storage after HPP was estimated. Our model not only calculated the appropriate shelf life and process conditions, but also provided a method for evaluating the risk of the recovery of pathogenic bacteria during storage.
Keywords: High pressure processing; Recovery; Logistic regression; Interface model

Maria G. Corradini, Micha Peleg, A Weibullian model for microbial injury and mortality, International Journal of Food Microbiology, Volume 119, Issue 3, 1 November 2007, Pages 319-328, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.08.035.
(http://www.sciencedirect.com/science/article/B6T7K-4PMJJX7-4/2/67ceeff2874d40e00e4143532a19b756)
Abstract:
A microbial survival curve is constructed by plotting the number of recoverable cells or their logarithm vs. the exposure time to the hostile agent, be it high or low temperature, a chemical preservative or disinfectant, etc. Since the recovery is usually done in a medium and under conditions that favor growth, the result is insensitive to whether the counted survivors are intact or injured. If or when both the total number of survivors and those remaining intact follow a Weibullian decay pattern (with different parameters), then the momentary number of injured cells will be the momentary difference between the two. Such a scenario can be easily modeled mathematically and the resulting model enables to simulate a variety of survived-injury patterns in thermal and non-thermal food preservation processes. Under certain conditions according to this model, almost all the survivors would be injured to at least some extent and hence may perish during the food's storage and transportation. Isothermal survival-injury curves generated with the Weibullian model

based on the above considerations were in general agreement with published experimental data. In principle, the methodology can be extended to simulate mortality-injury patterns under dynamic conditions, i.e., when the temperature or chemical agent's concentration vary with time. Whether a cell is considered injured depends on the recovery method, e.g., on whether it can or cannot grow in a saline medium. Thus recovery in different media may yield somewhat different quantitative results but very unlikely a qualitatively different pattern. Although the model used was based on that microbial mortality and injury both follow the Weibullian model, very similar results would have been obtained had other survival modes been assumed.
Keywords: Survival curves; Non-linear inactivation; Thermal processing; Chemical disinfection; High pressure processing (HPP); Cold preservation

J.I. Ortiz-Monasterio, N. Palacios-Rojas, E. Meng, K. Pixley, R. Trethowan, R.J. Pena, Enhancing the mineral and vitamin content of wheat and maize through plant breeding, Journal of Cereal Science, Volume 46, Issue 3, The Contribution of Cereals to a Healthy Diet, November 2007, Pages 293-307, ISSN 0733-5210, DOI: 10.1016/j.jcs.2007.06.005.
(http://www.sciencedirect.com/science/article/B6WHK-4P1P6VC-3/2/6e2d2dbdef2dc4dd795c834514f4d9bb)
Abstract:
More than half of the world's population suffers micronutrient undernourishment. The main sources of vitamins and minerals (iron, zinc, and vitamin A) for low-income rural and urban populations are staple foods of plant origin that often contain low levels or low bioavailability of these micronutrients. Biofortification aims to develop micronutrient-enhanced crop varieties through conventional plant breeding. HarvestPlus, the CGIAR's biofortification initiative, seeks to breed and disseminate crop varieties with enhanced micronutrient content that can improve the nutrition of the 'hard to reach' (by fortification or supplementation programmes) rural and urban poor in targeted countries/regions. In attempting to enhance micronutrient levels in maize and wheat through conventional plant breeding, it is important to identify genetic resources with high levels of the targeted micronutrients, to consider the heritability of the targeted traits, to explore the availability of high throughput screening tools and to gain a better understanding of genotype by environment interactions. Biofortified maize and wheat varieties must have the trait combinations which encourage adoption such as high yield potential, disease resistance, and consumer acceptability. When defining breeding strategies and targeting micronutrient levels, researchers need to consider the desired micronutrient increases, food intake and retention and bioavailability as they relate to food processing, anti-nutritional factors and promoters. Finally, ex ante studies are required to quantify the burden of micronutrient deficiency and the potential of biofortification to achieve a significant improvement in human micronutrient status in the deficient target population in order to determine whether a biofortification program is cost-effective.
Keywords: Micronutrient breeding; Maize and wheat; Iron, zinc, and provitamin A carotenoids

Youna Hemery, Xavier Rouau, Valerie Lullien-Pellerin, Cecile Barron, Joel Abecassis, Dry processes to develop wheat fractions and products with enhanced nutritional quality, Journal of Cereal Science, Volume 46, Issue 3, The Contribution of Cereals to a Healthy Diet, November 2007, Pages 327-347, ISSN 0733-5210, DOI: 10.1016/j.jcs.2007.09.008.
(http://www.sciencedirect.com/science/article/B6WHK-4PRYFYP-1/2/10e6861717412a96b781d05c49d6145a)
Abstract:
Numerous epidemiological studies have investigated the potential health benefits of consuming more wholegrain foods. However, in Europe, most wheat-based food products are made with refined endosperm from which the germ and peripheral layers (bran) are excluded, although these tissues have considerable nutritional potential and contain most of the micronutrients, phytochemicals and fibre of the grain. Dry fractionation technologies allow these peripheral tissues

to be separated and recovered to efficiently separate valuable from detrimental components (i.e. contaminants, antinutrient compounds, irritants), in order to develop nutritionally enhanced ingredients and products. The rational development of efficient processes requires the ability to monitor the fractionation and understand the fate of grain tissues, and to take into account the various properties of the different parts of the grain in order to design an appropriate fractionation protocol. This review provides an overview of the existing processes that can be used for the production of wheat products and fractions with enhanced nutritional interest. The grain composition and properties are briefly introduced with emphasis on nutritionally interesting compounds. Tissue markers and their application in process monitoring are presented, and the physical properties that influence the fractionation properties of grain tissues are developed. The main wheat dry fractionation processes are then reviewed, including pretreatments, degerming, debranning, and bran fractionation.
Keywords: Wheat; Bran; Aleurone; Whole grain; Dry-processing; Fractionation; Milling; Debranning; Ingredient; Nutritional quality

Maja Skrinjar, Majda Hadolin Kolar, Natasa Jelsek, Andreja Rizner Hras, Miran Bezjak, Zeljko Knez, Application of HPLC with electrochemical detection for the determination of low levels of antioxidants, Journal of Food Composition and Analysis, Volume 20, Issue 7, November 2007, Pages 539-545, ISSN 0889-1575, DOI: 10.1016/j.jfca.2007.04.010.
(http://www.sciencedirect.com/science/article/B6WJH-4NTB95K-1/2/09f19141c3f155e3e6fabba55d39bb7a)
Abstract:
This article presents a newly developed method for the determination of low levels of antioxidants, present in meat and meat products. The method is a high performance liquid chromatography (HPLC), using coulometric electrochemical detector. An oil soluble antioxidant, carnosic acid, extracted from rosemary was used as a target compound. Usual dosage of carnosic acid as an antioxidant in meat and meat products is 0.0040% (40 mg/kg), calculated on fat content. The ability to accurately measure low levels of antioxidants in food would be of great advantage to the food industry, because it would improve the process of partitioning of antioxidants into food system, which would lead to improved food stability and better prediction of its shelf life. The selectivity and sensitivity of the coulometric array are the key properties that were required for the analysis presented in this article. A coulometric technique is well suited for the determination of low levels of analyte and is one of the most sensitive analytical approaches available today.
Keywords: HLPC; Coulometric electrochemical detection; Antioxidants; Carnosic acid; Meat processing

Lan T.T. Bui, Darryl M. Small, The contribution of Asian noodles to dietary thiamine intakes: A study of commercial dried products, Journal of Food Composition and Analysis, Volume 20, Issue 7, November 2007, Pages 575-583, ISSN 0889-1575, DOI: 10.1016/j.jfca.2007.03.010.
(http://www.sciencedirect.com/science/article/B6WJH-4NK4G5G-2/2/a265e66407dddd63a48a16f125fc0de4)
Abstract:
Cereal based foods, including Asian noodles which represent the end use of at least one-eighth of global wheat production, are potentially good sources of thiamine. However, there is a lack of data on the stability of thiamine during processing. The aim of this study was to investigate the thiamine contents of three styles of Asian noodle products: white salted, yellow alkaline and instant. A standard method of analysis (Association of Official Analytical Chemists (AOAC), method number 953.17) was used to determine the thiamine content of noodles before and after cooking. Factors influencing thiamine stability were also investigated. The results showed that Asian noodles include products which vary significantly in formulation and are manufactured by distinct processes. pH levels were highest in yellow alkaline and lowest in white salted style. White salted

noodles have higher thiamine levels although there is clearly variation between individual samples for each style of product. For most samples, thiamine levels were relatively low and considerable losses occurred during cooking. Thiamine values were particularly low for samples where alkaline salts were incorporated during manufacture. It is concluded that greater losses occur where higher pH values were observed and there is considerable variation in the thiamine content of Asian noodles.
Keywords: Asian noodles; Nutrients; Retention; Thiamine

Viviane Scheibel, Carlos Roberto Appoloni, Radioactive trace measurements of some exported foods from the South of Brazil, Journal of Food Composition and Analysis, Volume 20, Issue 7, November 2007, Pages 650-653, ISSN 0889-1575, DOI: 10.1016/j.jfca.2007.04.005.
(http://www.sciencedirect.com/science/article/B6WJH-4NMWR7V-1/2/cdb60e291b1c49939706499cca20f4fe)
Abstract:
Investigation of radioactive traces in foods produced and exported mainly in Parana State, Brazil, was carried out by gamma-ray spectrometry, a non-destructive nuclear method. The redistribution of 40K concentration during the processing of soy (Glycine max) primary products (745+/-9 Bq kg-1 for soybean, 1473+/-15 Bq kg-1 for soy bran, and [less-than-or-equals, slant]8.8 Bq kg-1 for commercial refined soy oil) was verified. The 40K activity for all oil stages analyzed was lower than the limits of detection. Others foods such as sulfite-treated sugar, mate tea, and mint were analyzed. The activities for the natural nuclear chain (228Th and 226Ra) and the 137Cs (artificial radionuclide) were presented.
Keywords: Soy; Glycine max; Gamma-ray spectrometry; Natural radioactivity; Food safety

Tomasz Jelinski, Cheng-Jin Du, Da-Wen Sun, Jozef Fornal, Inspection of the distribution and amount of ingredients in pasteurized cheese by computer vision, Journal of Food Engineering, Volume 83, Issue 1, Future of Food Engineering - Selected Papers from the 2nd International Symposium of CIGR Section VI on Future of Food Engineering, November 2007, Pages 3-9, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.12.020.
(http://www.sciencedirect.com/science/article/B6T8J-4MV0M61-1/2/c3e9a6468a74705a915d133a755194bc)
Abstract:
As a consequence of market competition, the production and manufacture of cheese products are at the stage of innovative dynamics. Pasteurized cheese with vegetable ingredients is one of the new products that may be added to sandwiches, salads, sauce, toast and pizza. Since vegetable ingredients can improve the nutritive value and flavour of cheese, it will probably become more and more popular in the future. Such new products require new techniques for monitoring and evaluating their quality in order to satisfy the increased awareness and expectations of consumers. Computer vision methods have been used increasingly in the food industry for inspection and evaluation purposes as they provide a rapid, economical, consistent and objective assessment. The aim of this study was to develop a computer vision method for inspecting two major quality attributes of pasteurized cheese, i.e. the distribution and amount of ingredients. An image pre-processing algorithm was first developed to delete the border area of cheese. Next a three-step method for ingredient extraction was developed, comprising colour quantification, ingredient location, and mask operation. Finally, the distribution and amount of each ingredient was calculated automatically. Two kinds of pasteurized cheese were evaluated using the above method, i.e. (a) cheese with garlic and parsley and (b) cheese with a mixture of vegetables composed mainly of pepper and parsley. It was found that the distribution and amount of ingredients in the first set of samples were determined within an accuracy of over 88%, compared with the results of a sensory method. As for the second set of samples, accuracies of over 81%

and over 71% were achieved for measuring the distribution and amount of ingredients, respectively.
Keywords: Pasteurized cheese; Computer vision; Ingredients; Distribution; Quality evaluation

I. Allais, N. Perrot, C. Curt, G. Trystram, Modelling the operator know-how to control sensory quality in traditional processes, Journal of Food Engineering, Volume 83, Issue 2, EFFoST 2005 Annual Meeting: Innovations in Traditional Foods, November 2007, Pages 156-166, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.016.
(http://www.sciencedirect.com/science/article/B6T8J-4N3WYCJ-3/2/e7723253136aa3c821c7604350c67ed8)
Abstract:
Traditional foods are generally manufactured in small factories where operators often play an important role: (1) to make on-line evaluations of the properties of foods and/or (2) to adjust the process variables to ensure a smooth running of the process and respect of the quality requirements. The paper presents the methodological guideline we have developed to manage the expert-operator knowledge for controlling the sensory quality of food products. It involved several steps: collection of sensory measurements, instrumental measurements and heuristics controlling rules; modelling of the operator know-how by using suitable mathematical tools such as fuzzy logic or expert systems; development of decision support systems, easy to use by the operators. The principles and the results of the method will be illustrated by examples of traditional processes: dry sausage processing and biscuits aeration. As a conclusion, the main interests of the approach are underlined: traceability of the practices, safer measurements and practices, formation of inexperienced operators, increase of the reliability in the decision of the operators and valorisation of their role.
Keywords: Operator know-how; Decision support system; Dry sausage manufacturing; Biscuits aeration

M. Turtoi, A. Nicolau, Intense light pulse treatment as alternative method for mould spores destruction on paper-polyethylene packaging material, Journal of Food Engineering, Volume 83, Issue 1, Future of Food Engineering - Selected Papers from the 2nd International Symposium of CIGR Section VI on Future of Food Engineering, November 2007, Pages 47-53, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.11.017.
(http://www.sciencedirect.com/science/article/B6T8J-4MWXT0T-2/2/f4c43ec949f85ef84cd1e3e898302cb1)
Abstract:
Intense light pulse (ILP) is one of the emerging non-thermal techniques investigated as an alternative to traditional thermal treatment because it has been proven to be effective for microbial inactivation on food surfaces and food packages. The aim of this study was to evaluate the possibility of using pulsed light treatment for the effective killing of moulds on paper-polyethylene packaging material. Coupons of 20 x 20 mm paper-polyethylene were artificially contaminated with Cladosporium herbarum, Aspergillus niger, Aspergillus repens and Aspergillus cinnamomeus than subjected to different light energetic densities (from 0.244 to 0.977 J/cm2) for different durations (from 10 x 10-3 to 30 x 10-3 s). The results showed that there is a significant reduction of population along with an increase of light fluence and ILP treatment duration. The highest level of inactivation achieved in this study was about a 2.7-log reduction, which is more than enough for a normal contaminated packaging material. It is estimated that pulse light treatment could lead to an effective reduction of moulds, being also possible to obtain a sterile surface of the packaging material. Blastospores as those produced by C. herbarum are easier destroyed (z = 0.795 J/cm2) than fialospores as those produced by aspergilli (z = 0.81-0.927 J/cm2). Spore colour seems to play some role in spore resistance to light pulses: green fialospores, as those produced by A.

repens, has higher z values (0.927 J/cm2) than the black or brown ones as those produced by A. niger (z = 0.81 J/cm2), and A. cinnamomeus (z = 0.875 J/cm2) respectively.
Keywords: Intense light pulse treatment; Packaging material; Mould spores destruction; Food spoilage; D-value; z-value; Cladosporium herbarum; Aspergillus niger; Aspergillus repens; Aspergillus cinnamomeus

C. Barrera, N. Betoret, A. Heredia, P. Fito, Application of SAFES (systematic approach to food engineering systems) methodology to apple candying, Journal of Food Engineering, Volume 83, Issue 2, EFFoST 2005 Annual Meeting: Innovations in Traditional Foods, November 2007, Pages 193-200, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.034.
(http://www.sciencedirect.com/science/article/B6T8J-4N3WYCJ-4/2/ad015294eae31e2b144b3181be7695db)
Abstract:
The application of a vacuum pulse for a specified time before long term osmotic dehydration has been proposed to obtain candied fruits at mild temperatures, thus maintaining the characteristic attributes of fresh fruits. Information about main changes involved in apple candying by long term pulsed vacuum osmotic dehydration is missed by applying traditional methods of modelling foods and processes.
A new systematic approach to food engineering systems (SAFES) methodology has been recently developed and applied to predict quality and safety attributes from compositional and volumetric changes taking part throughout food processing. Identification and quantification of main components, phases and aggregation states at different stages of changes in which the process can be divided into would be required. Apart from experimental data and data found in references, several hypotheses related to water and soluble solids flow were also formulated for this purpose.
The application of SAFES methodology to the apple candying process highlights the usefulness of this tool in making evident that different mechanisms are involved in the process in a coupled way. Indeed, not only osmotic, but also pseudo-difusional and hydrodynamic mechanisms were responsible for compositional and volumetric changes occurring during apple candying to a different extend, depending on the concrete stage of the process. As a result, it should be necessary to analyse the process in different steps in order to avoid a confused knowledge of it.
Keywords: Candying; Vacuum impregnation; Osmotic dehydration; SAFES

C. Barrera, C. Chenoll, A. Andres, P. Fito, Application of SAFES (systematic approach to food engineering systems) methodology to French fries manufacture, Journal of Food Engineering, Volume 83, Issue 2, EFFoST 2005 Annual Meeting: Innovations in Traditional Foods, November 2007, Pages 201-210, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.019.
(http://www.sciencedirect.com/science/article/B6T8J-4N3WYCJ-2/2/b565c0c2cf3205d59a618a4fffb6eb0d)
Abstract:
Because of the high quality demanded by consumers, the study of French fries manufacture considering the product as an homogeneous system does not provide enough information on main compositional and volumetric changes occurring during potato processing. Attending to recent food quality and safety requirements, the SAFES methodology has been developed to precisely describe and quantify changes taking place throughout the operations involved in food processing. Considering different phases, components and aggregation states present in the food and applying the knowledge about its structure and the interactions between its components, those properties directly connected to food quality and safety can be defined.
In the present study, the application of SAFES methodology to French fries manufacture has been proved to be a useful tool to describe some textural attributes from quantitative changes in water and oil content, as well as in volume and starch aggregation state. Studying the French fries manufacture process by applying the SAFES methodology also showed the need of additional

information in certain areas of knowledge, as it could be the inactivation rate of enzymes that catalyse oxidation and the extraction rate of reducing carbohydrates during the blanching step. Apart from the experimental data and the mathematical models found in the bibliography, several hypotheses were formulated in relation to the amount of water retained by starch granules after the blanching process and the crust formation and development during the deep frying step. Information on water vapour retention by the crust layer at the end of the deep frying process was also considered, as it is directly connected with French fries quality after cooling.
Keywords: Frying; Blanching; French fries; SAFES

S. Cenkowski, C. Pronyk, D. Zmidzinska, W.E. Muir, Decontamination of food products with superheated steam, Journal of Food Engineering, Volume 83, Issue 1, Future of Food Engineering - Selected Papers from the 2nd International Symposium of CIGR Section VI on Future of Food Engineering, November 2007, Pages 68-75, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.12.002.
(http://www.sciencedirect.com/science/article/B6T8J-4MWXT0T-5/2/960a4bff36bfdaf14bd55bf1b1eb5455)
Abstract:
Food products can often be contaminated with mycotoxins and spores, many of which are resistant to heat. To ensure the safety of our food supply they must be reduced or eliminated from the final product through processing procedures. The effects of superheated steam (SS) as a processing medium on grains contaminated with the Fusarium mycotoxin deoxynivalenol (DON) and with Geobacillus stearothermophilus spores are presented here. The processing temperature was between 110 and 185 [degree sign]C with three steam velocities of 0.65, 1.3 and 1.5 m/s for DON contaminated wheat and between 105 and 175 [degree sign]C at one steam velocity of 0.35 m/s for mixture of sand and spores. Reductions in DON concentration of up to 52% were achieved at 185 [degree sign]C and 6 min processing time. This was due only to thermal degradation and not to solubilization and extraction. The effect of processing with SS on heat resistant spores was conducted for processing times of 0.5-480 min. The thermal resistance constant for G. stearothermophilus was determined to be 28.4 [degree sign]C for the SS processing temperature of 130-175 [degree sign]C. The first 5 min of SS processing were most effective in the reduction of spores. The use of SS has proven itself to be beneficial by reducing the contamination in foods in addition to any drying that may occur.
Keywords: Superheated steam; Processing; Drying; Oat groat; Wheat; Quality; Mycotoxins; Deoxynivalenol; Geobacillus stearothermophilus spores

C. Chenoll, N. Betoret, P.J. Fito, P. Fito, Application of the SAFES (systematic approach to food engineering systems) methodology to the sorption of water by salted proteins, Journal of Food Engineering, Volume 83, Issue 2, EFFoST 2005 Annual Meeting: Innovations in Traditional Foods, November 2007, Pages 250-257, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.023.
(http://www.sciencedirect.com/science/article/B6T8J-4N3WYCJ-8/2/57359e465426bb07b0725ab0bedb00b4)
Abstract:
In the meat industry there are some processes like drying or storage of salted meat products in which the knowledge of water sorption phenomena in salted proteins could be very useful. The sorption and desorption of most salted products is a singular process with three differentiated steps: aw < 0.75, aw = 0.75 and aw > 0.75. SAFES methodology allows the analysis of different elements in a system: the components, phases and states of aggregation in the food during the process to understand the process stages with a suitable level of complexity. It also analyzes the transport functions, chemical reactions and the phenomena occurring during the processing of the product. The aim of this paper is to analyze the sorption phenomena of water in salted proteins using the SAFES methodology for the three different steps of the water desorption process. Salted

pork meat isotherms at different three different salt concentrations and three various temperatures were analyzed in order to observe differences between them, in terms of mass transport, reactions, etc. With SAFES methodology, differences in the behaviour of the system, depending on the amount of NaCl added to the pork meat were observed. Differences in mass fluxes were found in relation to temperature and NaCl concentration.
Keywords: Isotherm; NaCl; SAFES

C. Chenoll, A. Heredia, L. Segui, P. Fito, Application of the systematic approach to food engineering systems (SAFES) methodology to the salting and drying of a meat product: Tasajo, Journal of Food Engineering, Volume 83, Issue 2, EFFoST 2005 Annual Meeting: Innovations in Traditional Foods, November 2007, Pages 258-266, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.024.
(http://www.sciencedirect.com/science/article/B6T8J-4N3WYCJ-9/2/3c4751b69092dd14362c9cab9c4ffad4)
Abstract:
Tasajo is a salted meat-based product made in Cuba, as a version of charqui, a traditional product consumed in many South American countries. Traditionally, meat is salted and afterwards sun dried, this is a long process which takes three weeks at least. In the industry, salting is done in two steps, first a wet salting step and afterwards a dry salting step. It is important to know the amount of salt and water in the final product in order to predict the spoilage of the product, the gaining of weight for financial considerations, etc. Safes methodology allows the analysis of different elements in a system: the components, phases and states of aggregation in the food during the different stages in the process, in order to understand these with a suitable level of complexity. It also analyzes the transport functions, chemical reactions and the phenomena occurring during the processing of the product. Using this methodology, shrinkage of cells has been found to be very similar to water loss in intracellular phase (48%). In this study, water and salt mass transfers during all the steps of the salting process have been quantified, pointing up and quantifying the changes in the state of aggregation of some components occurring in each step.
Keywords: Tasajo; SAFES; Salting; Drying

G. Urrutia, J. Arabas, K. Autio, S. Brul, M. Hendrickx, A. Kakolewski, D. Knorr, A. Le Bail, M. Lille, A.D. Molina-Garcia, A. Ousegui, P.D. Sanz, T. Shen, S. Van Buggenhout, SAFE ICE: Low-temperature pressure processing of foods: Safety and quality aspects, process parameters and consumer acceptance, Journal of Food Engineering, Volume 83, Issue 2, EFFoST 2005 Annual Meeting: Innovations in Traditional Foods, November 2007, Pages 293-315, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.03.004.
(http://www.sciencedirect.com/science/article/B6T8J-4N859SM-1/2/c5c30901b08f0c652721ab0614dbe803)
Abstract:
The SAFE ICE project, supported by the European Commission, addresses and overcomes specific scientific and technological hurdles to make an informed judgment on the relevance of food related effects of High-Pressure in the Low-Temperature (HPLT) domain as well as to realize and to deliver their full benefits to the end users. Such hurdles include the lack of systematic data, and a limited understanding related to the mechanisms involved in phase transitions under pressure at subzero temperatures. The project involves seven partners, bringing together academic and research centres with food industry and equipment manufacturing parties. The main findings of the research carried out in the frame of the project are: the systematic compilation of thermophysical properties of water, aqueous model solutions and model foods to be applied in mathematical models able to reproduce and predict freezing and thawing time profiles at high pressure; the comprehension of the kinetics of phase transition phenomena at HP, including the definition of metastable phases; a key to define critical processing parameters to obtain optimized

freezing and thawing paths; the study of the effect of HPLT on key food spoilage enzymes and on microorganisms; the study of consumer acceptance of the technology; the evaluation of the impact of SAFE ICE processes on food quality related parameters and the development of prototypes (HPLT microscopic cell and HPLT differential thermal analysis cell) and process and products concepts for industrial development of SAFE ICE processes.
Keywords: HPLT; Metastable phases; Phase transition; Freezing; Thawing

E.H. Tou, C. Mouquet-Rivier, C. Picq, A.S. Traore, S. Treche, J.P. Guyot, Improving the nutritional quality of ben-saalga, a traditional fermented millet-based gruel, by co-fermenting millet with groundnut and modifying the processing method, LWT - Food Science and Technology, Volume 40, Issue 9, November 2007, Pages 1561-1569, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.12.001. (http://www.sciencedirect.com/science/article/B6WMV-4N1SK1S-1/2/d9c1cf0bd35ffff75f9c09b1f8ea7a3d)
Abstract:
To improve the nutritional value of ben-saalga, a traditional gruel from Burkina Faso, co-fermentation of millet and groundnut (MG) was monitored using either the traditional processing method (MG-T) or a modified processing method including precooking, addition of malt and inoculation by backslopping (MG-CMI). Fermentation kinetics and microbial composition in the two processing methods were characterized and compared to that of ben-saalga process used as control. The fermented pastes from control, MG-T and MG-CMI experiments had a low pH of around 3.9. Their microbiota were dominated by lactic acid bacteria (LAB) with amylolytic LAB:LAB ratios of respectively 12%, 4% and 15%. In MG-T paste, glucose and fructose were the main substrates for lactic acid fermentation and their concentration decreased during settling, whereas in MG-CMI paste, the main substrate was maltose and its concentration increased transiently. At a suitable consistency, the dry matter content of MG-CMI gruel was almost twice as high as that of ben-saalga. During the three processing methods, phytate content decreased of about 75%, 50% and 66%, respectively. Thanks to the incorporation of groundnut, the macronutrient balance of MG-T and MG-CMI met the requirements for complementary foods but only the MG-CMI gruel had sufficient energy density.
Keywords: Pearl millet; Groundnut; Complementary food; Nutritional quality; Lactic acid fermentation

Colin H.L. Ho, Juan E. Cacace, G. Mazza, Extraction of lignans, proteins and carbohydrates from flaxseed meal with pressurized low polarity water, LWT - Food Science and Technology, Volume 40, Issue 9, November 2007, Pages 1637-1647, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.12.003. (http://www.sciencedirect.com/science/article/B6WMV-4MP56DX-1/2/aa4641d0ea83682fe7fe7c86a16cbf91)
Abstract:
This study examined the application of pressurized low polarity water (PLPW) extraction of lignans, proteins and carbohydrates from defatted flaxseed meal. Key processing conditions included temperature (130, 160, 190 [degree sign]C), solvent pH (4, 6.5 and 9), solvent to solid ratio (90, 150 and 210 mL/g) and introduction of co-packing material (0 and 3 g glass beads). The addition of 3 g glass beads increased the yields for all target compounds. The maximum yield of lignans (21 mg/g meal) was obtained at 170 [degree sign]C with solvent to solid ratio of 100 mL/g meal at pH 9. Optimal conditions for protein extraction were pH 9, solvent to solid ratio of 210 mL/g meal and 160 [degree sign]C. Total carbohydrates recovery was maximized at 215 mg/g meal (50% recovery) at pH 4 and 150 [degree sign]C with solvent to solid ratio of 210 mL/g meal. The increase of temperature accelerated extraction, thus reducing solvent volume and time to reach equilibrium. For the extraction of proteins and carbohydrates, however, a temperature of 130-160 [degree sign]C is recommended, as proteins and carbohydrates are vulnerable to thermal degradation.

Keywords: Phenolics; Lignans; Proteins; Carbohydrates; Extraction; Subcritical water; Flaxseed meal; Functional foods; Bioactives

Julita M. Manski, Atze J. van der Goot, Remko M. Boom, Advances in structure formation of anisotropic protein-rich foods through novel processing concepts, Trends in Food Science & Technology, Volume 18, Issue 11, November 2007, Pages 546-557, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.05.002.
(http://www.sciencedirect.com/science/article/B6VHY-4NS2GFR-1/2/050d50df827d0aa483426c274fb2ce65)
Abstract:
Development of protein-rich food products is currently limited by lack of scientific insights in structuring processes. The application of well-defined flow appears to be a good tool to create novel anisotropic food structures, on one hand, and to improve understanding of the behavior of protein-rich materials during processing, on the other hand. Concentrated protein dispersions show similarities with polymer systems under flow. Also in protein dispersions, the size of structural elements and interactions present account for structural changes due to flow. These insights can form a basis for the design of dedicated food structuring equipment.

Francisco Jimenez-Colmenero, Healthier lipid formulation approaches in meat-based functional foods. Technological options for replacement of meat fats by non-meat fats, Trends in Food Science & Technology, Volume 18, Issue 11, November 2007, Pages 567-578, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.05.006.
(http://www.sciencedirect.com/science/article/B6VHY-4NWCGT8-1/2/7b04526cbe64262e8be37ae27bc67bf7)
Abstract:
Healthier lipid formulation based on processing strategies is one of the most important current approaches to the development of potential meat-based functional foods. This article discusses the partial replacement of meat fats with various non-meat fats (of plant and marine origin) which are added to different meat products (fresh, cooked and fermented), using a variety of available technological options. It analyses factors associated with the composition and physicochemical properties of the new lipid materials used in meat processing. And it further discusses the consequences of changes in the composition of meat products as they relate to the potential contribution to fatty acid intake goals and lipid oxidation stability.

Ludwig Niessen, PCR-based diagnosis and quantification of mycotoxin producing fungi, International Journal of Food Microbiology, Volume 119, Issues 1-2, Mycotoxins from the Field to the Table, 20 October 2007, Pages 38-46, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.023.
(http://www.sciencedirect.com/science/article/B6T7K-4P9SN8X-K/2/fa9e56d1307f980c6402f924ac84a3a1)
Abstract:
Mycotoxins are secondary metabolites produced by filamentous fungi which have toxicologically relevant effects on vertebrates when administered in small doses via a natural route. In order to improve food safety and to protect consumers from harmful contaminants, presence of fungi with the potential to produce such compounds must be checked at critical control points during production of agricultural commodities as well as during the process of food and feed preparation. Polymerase chain reaction (PCR) based diagnosis has been applied as an alternative assay replacing cumbersome and time consuming microbiological and chemical methods for detection and identification of the most serious toxin producers in the fungal genera Fusarium, Aspergillus, and Penicillium. The current review covers the numerous PCR-based assays which have been

published over the last decade since the first description of the use of this technology to detect aflatoxin biosynthesis genes in A. flavus.
Keywords: Mycotoxin; PCR; Detection; Quantification; Biosynthesis; Genome aided processing; GAP

Naresh Magan, David Aldred, Post-harvest control strategies: Minimizing mycotoxins in the food chain, International Journal of Food Microbiology, Volume 119, Issues 1-2, Mycotoxins from the Field to the Table, 20 October 2007, Pages 131-139, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.034.
(http://www.sciencedirect.com/science/article/B6T7K-4P9SN8X-D/2/d6f15d22937762c6baeefa87e67a3b9c)
Abstract:
Contamination of cereal commodities by moulds and mycotoxins results in dry matter, quality, and nutritional losses and represents a significant hazard to the food chain. Most grain is harvested, dried and then stored on farm or in silos for medium/long term storage. Cereal quality is influenced by a range of interacting abiotic and biotic factors. In the so-called stored grain ecosystem, factors include grain and contaminant mould respiration, insect pests, rodents and the key environmental factors of temperature, water availability and intergranular gas composition, and preservatives which are added to conserve moist grain for animal feed. Thus knowledge of the key critical control points during harvesting, drying and storage stages in the cereal production chain are essential in developing effective prevention strategies post-harvest. Studies show that very small amounts of dry matter loss due to mould activity can be tolerated. With < 0.5% dry matter loss visible moulding, mycotoxin contamination and downgrading of lots can occur. The key mycotoxigenic moulds in partially dried grain are Penicillium verrucosum (ochratoxin) in damp cool climates of Northern Europe, and Aspergillus flavus (aflatoxins), A. ochraceus (ochratoxin) and some Fusarium species (fumonisins, trichothecenes) on temperate and tropical cereals. Studies on the ecology of these species has resulted in modelling of germination, growth and mycotoxin minima and prediction of fungal contamination levels which may lead to mycotoxin contamination above the tolerable legislative limits (e.g. for ochratoxin). The effect of modified atmospheres and fumigation with sulphur dioxide and ammonia have been attempted to try and control mould spoilage in storage. Elevated CO2 of > 75% are required to ensure that growth of mycotoxigenic moulds does not occur in partially dried grain. Sometimes, preservatives based on aliphatic acids have been used to prevent spoilage and mycotoxin contamination of stored commodities, especially feed. These are predominantly fungistats and attempts have been made to use alternatives such as essential oils and anti-oxidants to prevent growth and mycotoxin accumulation in partially dried grain. Interactions between spoilage and mycotoxigenic fungi and insect pests inevitably occurs in stored grain ecosystems and this can further influence contamination with mycotoxins. Effective post-harvest management of stored commodities requires clear monitoring criteria and effective implementation in relation to abiotic and biotic factors, hygiene and monitoring to ensure that mycotoxin contamination is minimised and that stored grain can proceed through the food chain for processing.
Keywords: Drying; Dry matter loss; Mycotoxins; Cereals; Preservation; Spoilage fungi

Lloyd B. Bullerman, Andreia Bianchini, Stability of mycotoxins during food processing, International Journal of Food Microbiology, Volume 119, Issues 1-2, Mycotoxins from the Field to the Table, 20 October 2007, Pages 140-146, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.035.
(http://www.sciencedirect.com/science/article/B6T7K-4P9SN8X-F/2/6fbe1fd19d7b951ad6d7b843c2de57e0)
Abstract:
The mycotoxins that commonly occur in cereal grains and other products are not completely destroyed during food processing operations and can contaminate finished processed foods. The

mycotoxins most commonly associated with cereal grains are aflatoxins, ochratoxin A, fumonisins, deoxynivalenol and zearalenone. The various food processes that may have effects on mycotoxins include sorting, trimming, cleaning, milling, brewing, cooking, baking, frying, roasting, canning, flaking, alkaline cooking, nixtamalization, and extrusion. Most of the food processes have variable effects on mycotoxins, with those that utilize the highest temperatures having greatest effects. In general the processes reduce mycotoxin concentrations significantly, but do not eliminate them completely. However, roasting and extrusion processing show promise for lowering mycotoxin concentrations, though very high temperatures are needed to bring about much of a reduction in mycotoxin concentrations. Extrusion processing at temperatures greater than 150 [degree sign]C are needed to give good reduction of zearalenone, moderate reduction of alfatoxins, variable to low reduction of deoxynivalenol and good reduction of fumonisins. The greatest reductions of fumonisins occur at extrusion temperatures of 160 [degree sign]C or higher and in the presence of glucose. Extrusion of fumonisin contaminated corn grits with 10% added glucose resulted in 75-85% reduction in Fumonisin B1 levels. Some fumonisin degredation products are formed during extrusion, including small amounts of hydrolyzed Fumonisin B1 and N-(Carboxymethyl) -- Fumonisin B1 and somewhat higher amounts of N-(1-deoxy-d-fructos-1-yl) Fumonisin B1 in extruded grits containing added glucose. Feeding trial toxicity tests in rats with extruded fumonisin contaminated corn grits show some reduction in toxicity of grits extruded with glucose.
Keywords: Mycotoxins; Extrusion; Thermal Processing; Aflatoxins; Fumonisins; Deoxynivalenol

Stanislas Dubois, Julio Cesar Marin-Leal, Michel Ropert, Sebastien Lefebvre, Effects of oyster farming on macrofaunal assemblages associated with Lanice conchilega tubeworm populations: A trophic analysis using natural stable isotopes, Aquaculture, Volume 271, Issues 1-4, 3 October 2007, Pages 336-349, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2007.03.023.
(http://www.sciencedirect.com/science/article/B6T4D-4NC4M7G-6/2/d5d76b458cc8bb6c2f6be7a2945d6fdc)
Abstract:
The macrobenthic assemblages associated with aggregations of Lanice conchilega polychaetes under and near oyster culture tables were investigated with regard to the food web. Samples were collected from a reference site without oyster influence and from a site beneath oyster tables. While no changes in species diversity were observed, we showed a profound effect of shellfish structures both on the composition of macrobenthic assemblages, and on the trophic structure of the food web. Predators predominated in sediments beneath oyster tables, both in number of individuals and in biomass, and other suspension-feeders were excluded. Oysters are seen here as key species in exerting a top-down control on water quality and food resources. Stable isotopic analysis allowed calculation of trophic position for organisms and provided an in-depth understanding of interspecific relationships, especially among polychaetes. We showed two distinct trophic pathways, one dominated by Nephtys hombergii in reference sediments, and the other dominated by Lumbrineris tetraura beneath oyster tables. Microphytobenthos and detritus of macroalgae seemed to contribute most to the suspension-feeders' diets, but we observed high [delta]15N values in surface and sub-surface deposit-feeders, which indicated they utilized sedimentary organic matter after bacterial processing and subsequent isotopic fractionation.
Keywords: Diversity; Trophic pathway; [delta]13C and [delta]15N; Polychaetes; Feeding guilds; Shellfish farming; English Channel

Jean Pierre Jouany, Methods for preventing, decontaminating and minimizing the toxicity of mycotoxins in feeds, Animal Feed Science and Technology, Volume 137, Issues 3-4, Fusarium and their toxins: Mycology, occurrence, toxicity, control and economic impact, 1 October 2007, Pages 342-362, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2007.06.009.
(http://www.sciencedirect.com/science/article/B6T42-4P7FCW1-2/2/6c27652fbad7532ebf120193499b565c)

Abstract:
Moulds and associated mycotoxins are important factors adversely affecting foods produced using contaminated plant products or animal products derived from animals fed on contaminated feeds. Mycotoxins are toxic to humans and animals, which explains the major concern of food and feed industries in preventing them from entering the food chain. Prevention is essential since there are few ways to completely overcome problems once mycotoxins are present.
Toxin-producing moulds may invade plant material in the field before harvest, during post-harvest handling and storage and during processing into food and feed products. Thus, toxigenic fungi have been roughly classified into two groups (i) field fungi; (ii) storage fungi. The Fusarium genus, e.g. F. verticillioides (formerly F. moniliforme), F. roseus, F. tricinctum and F. nivale, are ubiquitous soil organisms, which may infect cereals directly in the field thereby, increasing fumonisins, trichothecene, and zearalenone levels (depending on the species) during growth, ripening of grain and at harvesting. Fusarium sp. can have deleterious effect on plants and decrease plant productivity. Many species can infect heads of wheat and other small grain cereals in fields causing head scab or blight (FHB). Ear rot also can be caused by Fusarium sp. growing on maize. Furthermore, fungi can grow on the non-grain part of plants producing large amounts of mycelium towards the stem where it colonizes the vascular bundles, which inhibits the transfer of nutrients in the upper part of the plant. On the contrary, Fusarium sp. does not significantly contribute to the storage fungi or to the fungal contaminants found only on damaged grains.
Due to the multiple possible origins of fungal infection, any prevention strategy for fungal and mycotoxin contamination must be carried out at an integrative level all along the food production chain. Three steps of intervention have been identified. The first step in prevention should occur before any fungal infestation; the second step is during the period of fungal invasion of plant material and mycotoxin production; the third step is initiated when the agricultural products have been identified as heavily contaminated. Such hazard analysis has some similarity with the HACCP management system of food safety [Degirmencioglu N., Esecali H., Cokal Y., Bilgic M., 2005. From safety feed to safety food: the application of HACCP in mycotoxin control. Arch. Zootech. 8, 19-32], mainly with the principles 2 (Determination of critical control points) and 3 (Establish critical limits). Most of the efforts must be concentrated on the two first steps since, once mycotoxins are present, it is difficult to eliminate them in a practical way.
Keywords: Prevention; Decontamination; Mycotoxins; Feeds

Subbiah Poopathi, S. Abidha, Use of feather-based culture media for the production of mosquitocidal bacteria, Biological Control, Volume 43, Issue 1, October 2007, Pages 49-55, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2007.04.019.
(http://www.sciencedirect.com/science/article/B6WBP-4NTBFJC-1/2/a166e2c403892b41df608d46ac64a3e0)
Abstract:
Human industrial activities, inevitably, generate industrial wastes, consisting of, inorganic and organic materials, discharged from factories, fisheries, poultries and food processing industries. Degrading or handling these wastes, as unused disposals, without acquiring any additional benefits has led to an idea to develop a suitable technology to utilize bio-organic wastes. Chicken feathers have been discarded in bulk as waste from poultry processing industries, poultry farms and shops, globally. They normally accumulate structural proteins (keratins) that are resistant to biodegradation. Considering the abundant supply of these feather wastes, we have successfully produced the biopesticides by culturing Bacillus sphaericus (Bs) and Bacillus thuringiensis serovar israelensis (Bti) strains to synthesize mosquitocidal toxins. Biochemical studies indicate that the mosquitocidal spore/crystal toxins produced from the experimental culture medium (chicken feather waste medium, CFWM) are similar to that of conventional medium (Nutrient Yeast Extract Salt Medium, NYSM). The bacteria produced in these media (NYSM and CFWM) were bioassayed against the mosquito vectors (Culex quinquefasciatus, Anopheles stephensi, Aedes aegypti) and

the toxic effect was found to be comparable. Cost-effective analysis indicates that the use of chicken feather waste as culture medium is highly economical for the industrial production of these mosquito pathogenic bacilli. This study is, therefore, very important as it possesses the dual benefit of effective utilization of bio-organic waste materials from the environment and for the production of mosquitocidal biopesticides as well.
Keywords: Chicken feather waste; Bacillus species; Culture medium; Crystal toxins; Mosquito control; Cost-effectiveness

Yu-Long Gao, Xing-Rong Ju, Wei-Fen Qiu, Han-Hu Jiang, Investigation of the effects of food constituents on Bacillus subtilis reduction during high pressure and moderate temperature, Food Control, Volume 18, Issue 10, October 2007, Pages 1250-1257, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.08.007.
(http://www.sciencedirect.com/science/article/B6T6S-4M57H2V-2/2/f667d41d8fe2033c0c2a5c993a56052a)
Abstract:
Our published results and our studies for optimization of process conditions to inactivate Bacillus subtilis by high hydrostatic pressure and mild heat using response surface methodology indicated that the optimum process parameters for a six-log-cycle reduction of B. subtilis were obtained as temperature, 46 [degree sign]C; pressure, 479 MPa; and pressure holding time, 14 min. Based on the results, response surface methodology (RSM) was employed in the present investigation, the effects of food constituents like soybean protein, soybean oil, sucrose, and pH of food matrix on the B. subtilis reduction during high pressure and moderate heat was studied, and a quadratic polynomial predictive model for the effects of food constituents and pH of food matrix on B. subtilis reduction during high pressure and moderate heat was built with RSM accurately. The experimental results showed that the efficiencies of B. subtilis reduction in milk buffer and food matrix designed in the present work, under the condition of high pressure treatment process parameters described above, had some differences. The soybean protein ($P < 0.0001$), sucrose ($P < 0.0001$), and pH ($P = 00006$) significantly affected reduction of B. subtilis. The effect of soybean oil on reduction of B. subtilis was not significant ($P = 0.8363$). The adequacy of the predictive model equation for predicting B. subtilis reduction in food matrix by high pressure and moderate heat was verified effectively using experimental test date that was not used in the development of the model.
Keywords: High pressure processing (HPP); Food constituents; Response surface methodology (RSM)

Joseph Schlesser, Measurement and Control in Food Processing, M. Bhuyan. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA (2007). 340pp., Hardback, Price: $159.95, ISBN:978-0-8493-7244-5., Food Microbiology, Volume 24, Issues 7-8, October-December 2007, Pages 804-805, ISSN 0740-0020, DOI: 10.1016/j.fm.2007.03.007.
(http://www.sciencedirect.com/science/article/B6WFP-4N9880R-1/2/62cb619b5b9f79cf60b823427ba624a6)

Stephen Min, S.K. Sastry, V.M. Balasubramaniam, In situ electrical conductivity measurement of select liquid foods under hydrostatic pressure to 800 MPa, Journal of Food Engineering, Volume 82, Issue 4, October 2007, Pages 489-497, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.03.003.
(http://www.sciencedirect.com/science/article/B6T8J-4N7XP2F-1/2/b6f945aadb642e0c9279f8f003549bfb)
Abstract:
Electrical conductivity of select liquid foods and salt solutions was measured in situ during high pressure processing using a specially designed parallel electrode conductivity cell. Cell constants

at atmospheric pressure were determined with KCl standards and calculated against standard data, while cell constants under pressure were estimated assuming isotropic compression. Measured conductivities of NaCl solutions under pressure were within 5.7% of previously reported data at pressures up to 800 MPa and temperatures to 61 [degree sign]C. Electrical conductivity of NaCl and KCl solutions, orange juice, apple juice, tomato juice, and soybean oil were measured in triplicate in 100 MPa increments from 0.1 to 800 MPa. 0.01 m salt solutions were measured at 25 and 50 [degree sign]C; 0.1 m salt solutions, juice and oil samples were measured at 25 [degree sign]C. Results show conductivity of salt solutions and juice samples increased as a function of pressure, peaking between 200 and 500 MPa and decreasing above 500 MPa. Except for soybean oil, pressure had a significant effect ($p < 0.01$) on electrical conductivity for all samples. Temperature had a significant effect ($p < 0.01$) on electrical conductivity of 0.01 m salt solutions at all pressures. Conductivity of soybean oil was too low to be measured at atmospheric and pressurized conditions.
Keywords: High pressure processing; Electrical conductivity; Juice; Salts; In situ measurement; Sensor

Sandro M. Goni, Emmanuel Purlis, Viviana O. Salvadori, Three-dimensional reconstruction of irregular foodstuffs, Journal of Food Engineering, Volume 82, Issue 4, October 2007, Pages 536-547, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.03.021.
(http://www.sciencedirect.com/science/article/B6T8J-4N9P4F4-1/2/a44b3a6b1a956bfde3225bbe6316613e)
Abstract:
Three-dimensional reconstruction of general solid food materials was performed using a reverse engineering method based on a surface cross-sectional design. Digital images of cross-sections of irregular multi-dimensional foodstuffs were acquired using a computer vision system, and image processing was performed to obtain the actual boundaries. These boundaries were then approximated by closed B-spline curves, which were assembled through a lofting technique to construct a geometrical representation of food materials. Considering the reconstructed objects, a procedure based on finite element method was developed to estimate the surface area and volume. The developed finite element method approach was validated against experimental volume values of apples and meat pieces, obtaining an estimation error less than 2%. Surface area prediction equations were proposed from estimated surface area values and weight and volume measurements. Good agreement was found with previously reported results.
Keywords: Lofting; B-spline curves; Irregular shape; Surface area

Chuan-He Tang, Functional properties and in vitro digestibility of buckwheat protein products: Influence of processing, Journal of Food Engineering, Volume 82, Issue 4, October 2007, Pages 568-576, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.01.029.
(http://www.sciencedirect.com/science/article/B6T8J-4N9DJPS-2/2/8b51c9760c5f33af5636454417a83ffc)
Abstract:
The effect of processing on some functional properties and in vitro digestibility of buckwheat protein products (BWP) was investigated. In the spray-dried cases, the protein solubility (PS) of BWP was much greater than that of commercial soy protein isolates (SPI) at below pH 5 and above pH 6 ($P < 0.05$). At below pH 7, the PS of those BWPs by ultrasonic-assisted extraction was higher than that by mechanical extraction or by ultrasonic-assisted extraction and additional de-fatting treatment. The water holding capacity of those BWPs obtained by freeze-drying was also significantly higher than that by spray-drying ($P < 0.05$). The fat adsorption capacity of freeze-dried BWPs was significantly higher than that of SPI and those spray-dried BWPs ($P < 0.05$). The emulsifying activity index (EAI) of some spray-dried BWPs was higher than that of SPI at below pH 4 and above pH 6, while the emulsion stability index (ESI) was lower than that of SPI at below pH

7 ($P < 0.05$). The de-fatting pretreatment could improve the EAI and ESI of BWP, especially at above pH 6. In simulated gastric fluid, the digestion pattern of BWP was evidently different from that of SPI. In the pepsin digestion, the % N release was affected by the processing. The BWPs with low lipid contents had higher % N release as compared to those with high lipid contents. These results suggested that the functional properties and in vitro digestibility of BWP be associated with its lipid and ash contents, which could be affected by processing. Thus, functional and nutritional BWPs, potential for food applications, can be produced through controlling the processing.
Keywords: Buckwheat protein products (BWP); Functional property; In vitro digestibility; Processing; ultrasonic

Sencer Buzrul, A suitable model of microbial survival curves for beer pasteurization, LWT - Food Science and Technology, Volume 40, Issue 8, October 2007, Pages 1330-1336, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.10.005.
(http://www.sciencedirect.com/science/article/B6WMV-4MH8HWR-3/2/3714544c8e8ba2e93abdd13cd1bdd1c3)
Abstract:
Published isothermal inactivation data indicated that beer can undergo under- or over-processing depending on the target log reduction and the shape of the survival curve of a microorganism if traditional first-order model is used. This was demonstrated for a mold, yeasts and lactic acid bacteria by use of a more flexible and convenient model than the first-order model, namely Weibull model. The parameters of the Weibull model can be reduced from two to one with a very a slight loss of goodness-of-fit. The validity of the proposed model should also be checked for mixed populations of microorganisms in beer and non-isothermal treatments for beer. Beer can be the first product to validate the proposed model in industrial base since it has been free from problems with pathogenic microorganisms. If the model provides the requirements then it can also be used in other food products. This will minimize the energy expenditure for pasteurization and provide minimal processing to achieve a better food quality.
Keywords: Beer; Under-processing; Over-processing; Weibull; First-order model; Minimal processing

Gerry P. Schamberger, Theodore P. Labuza, Effect of green tea flavonoids on Maillard browning in UHT milk, LWT - Food Science and Technology, Volume 40, Issue 8, October 2007, Pages 1410-1417, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.09.009.
(http://www.sciencedirect.com/science/article/B6WMV-4MBJYB0-1/2/362ce749b2257d1ce3a365d0cb727d8f)
Abstract:
The ability of green tea flavonoids to control Maillard browning was investigated. Epicatechin (EC) and epigallocatechin gallate (EGCG) were added at levels of 0.l and 1.0 mmol/l to a glucose/glycine model system as well as into milk that was then thermally processed in a Microthermics processing system. Samples were assessed with (1) front-face fluorescence spectroscopy for Maillard browning, (2) Hunter L*, a*, and b*; and (3) sensory analysis. In the model gluocose/glycine system, EC and EGCG reduced Maillard fluorescence at the 0.1 mmol/l level, while fluorescence was negligible with added flavonoids at 1.0 mmol/l. When these flavonoids were added to milk, they reduced the production of Maillard associated fluorescence with UHT processing. EC and EGCG also reduced the [Delta]E (Total color difference) during thermal processing. Throughout shelf-life testing, these compounds reduced Maillard associated fluorescence in milk. Milk samples processed with these extracts were monitored by sensory analysis during extended storage. The sensory evaluation found the green tea milk samples to be of similar liking to the control milk. These flavonoids may be of use to the food industry to control Maillard browning.

Keywords: Maillard browning; Milk; Fluorescence; Epicatechin; Epigallocatechin gallate

Hajime Takahashi, Satoko Handa-Miya, Bon Kimura, Miki Sato, Asami Yokoi, Seitaro Goto, Itaru Watanabe, Takashi Koda, Kazuo Hisa, Tateo Fujii, Development of multilocus single strand conformation polymorphism (MLSSCP) analysis of virulence genes of Listeria monocytogenes and comparison with existing DNA typing methods, International Journal of Food Microbiology, Volume 118, Issue 3, 30 September 2007, Pages 274-284, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.047.
(http://www.sciencedirect.com/science/article/B6T7K-4PC8RBR-2/2/7dd4e1a007d83f87f5e756e47e3749b2)
Abstract:
Development of rapid and simple typing methods is required for analyzing the distribution and contamination routes of food-borne pathogens. We established a simple typing method for Listeria monocytogenes using MLSSCP (Multilocus Single Strand Conformation Polymorphism) analysis. Four virulence genes, hlyA, iap, actA and inlB were amplified by PCR, digested with endonucleases and applied to gels for SSCP. As banding patterns have been shown to reflect even a single nucleotide difference, this method has a potential discriminatory power comparable to that of sequencing analysis. The 64 strains isolated from five meat processing plants were divided into 18 groups by this MLSSCP. Additionally, clustering obtained with this method showed strong correspondence with phylogenetic lineages I and II, and was achieved with much less expenditure in time and cost than is required for other methods, such as MLST. The validity of the MLSSCP lineage classification was confirmed by PFGE, AFLP and ribotyping results. This newly developed MLSSCP method is suitable when obtaining accurate results quickly and simply is crucial.
Keywords: Listeria monocytogenes; Typing; SSCP; Meat products

W. Bang, M.A. Drake, L.A. Jaykus, Recovery and detection of Vibrio vulnificus during cold storage, Food Microbiology, Volume 24, Issue 6, September 2007, Pages 664-670, ISSN 0740-0020, DOI: 10.1016/j.fm.2006.12.002.
(http://www.sciencedirect.com/science/article/B6WFP-4MPC444-2/2/a17508449be03ba924cee57739608209)
Abstract:
Different cultural techniques and molecular methods for the detection of Vibrio vulnificus during cold storage in a model broth system were compared. Two strains of V. vulnificus were grown to stationary phase and inoculated (106 CFU/mL) into tryptic soy broth with 2% sodium chloride (TSBN2) or artificial seawater (ASW), both pre-chilled to 5 [degree sign]C. These were stored for 10 days, with sub-sampling conducted at time 0 and every 2 days thereafter. Each subsample was plated, by both pour and spread plate techniques, onto tryptic soy agar 2% sodium chloride (TSAN2) with or without catalase (400 or 600 U) or sodium pyruvate (80 or 160 mg) supplementation. Nucleic acids were extracted from subsamples and subjected to PCR and RT-PCR with hemolysin as the target. Higher recoveries of V. vulnificus were obtained with spread plating compared to pour plating ($P<0.05$). The addition of sodium pyruvate (80 mg) or catalase (400 U) significantly increased cell recovery ($P<0.05$). PCR amplification signals were stronger than RT-PCR signals at each timepoint, and results were generally consistent between TSAN2 and ASW for each strain. These results will aid in the design of optimum methods to recover and/or detect V. vulnificus cells subjected to sublethal stress that might be encountered in food processing and storage.
Keywords: V. vulnificus; Cold storage; Cell recovery

Melanie Mireaux, David N. Cox, Amy Cotton, Greg Evans, An adaptation of repertory grid methodology to evaluate Australian consumers' perceptions of food products produced by novel

technologies, Food Quality and Preference, Volume 18, Issue 6, September 2007, Pages 834-848, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2007.01.012.
(http://www.sciencedirect.com/science/article/B6T6T-4N2D2S3-3/2/25ab58f321b1b5b2184419e090b66956)
Abstract:
To assess the acceptance of novel food technologies, the Repertory Grid Method was used in 13 focus groups of two age groups (younger 20-40 yr and older 40-60 yr). Seventy-two subjects were presented with text descriptions of 12 products produced by novel and established technologies, grouped in four triads. A facilitator elicited perceived attributes (constructs) from focus group participants which were then rated by individuals on semi-structured line scales on personal computers. Generalised Procrustes analysis revealed that high pressure processing (HPP) applied to orange juice was favourably perceived. Generally other novel products were strongly associated with 'unknown consequences' and 'interference' despite several novel technologies claiming to have health or environmental benefits, however, younger participants were generally more positive. Furthermore preference scores for products produced by novel technologies were all, with the exception of HPP, significantly lower ($p < 0.05$) than for conventional products.
Keywords: Preferences; Genetic modification; High pressure processing; Low-dose irradiation; Omega-3; Stem cell; Triploidy; Orange juice; Prawns; Beef; Margarine; RGM; GPA

S.Y. Wang, Y.R. He, H.L. Lu, J.X. Zheng, G.D. Liu, Y.L. Ding, Numerical Simulations of Flow Behaviour of Agglomerates of Nano-Size Particles in Bubbling and Spouted Beds with an Agglomerate-Based Approach, Food and Bioproducts Processing, Volume 85, Issue 3, September 2007, Pages 231-240, ISSN 0960-3085, DOI: 10.1205/fbp07003.
(http://www.sciencedirect.com/science/article/B8JGD-4S1T0R4-C/2/fd060b3532d4aa8f9b45f740624b1c46)
Abstract:
Numerical simulations are performed on the behaviour of agglomerates of nanoparticles in bubbling gas fluidized beds and spouted beds--systems that are widely used in handling and processing particulate solids in various industrial sectors including biomaterials, foods and pharmaceuticals. An Eulerian two-fluid approach is used and the cohesive force between particles is considered. An empirical expression for the solids pressure of agglomerates is used (Jung and Gidaspow, 2002). The interaction between gas and agglomerates is considered with an agglomerate-based approach. Simulated results show that the fluidized bed has a very high expansion ratio with no distinct bubbles in the bubbling fluidized bed. In the spouted bed, however, the concentration of agglomerates is nearly homogeneous in both the dilute and transitional zones. The velocity of agglomerates is found to be higher than that in the annulus region, whereas the concentration distribution shows an opposite trend with a nearly closing packing of agglomerates in the annulus region. A high spouting gas velocity is shown to be required to fluidize agglomerates in the spouted bed. Comparisons of the modelling results are also made with limited experimental results.
Keywords: spouted bed; bubbling gas fluidized bed; agglomerates of nanoparticles

J. Sundaram, T.D. Durance, Influence of Processing Methods on Mechanical and Structural Characteristics of Vacuum Microwave Dried Biopolymer Foams, Food and Bioproducts Processing, Volume 85, Issue 3, September 2007, Pages 264-272, ISSN 0960-3085, DOI: 10.1205/fbp07012.
(http://www.sciencedirect.com/science/article/B8JGD-4S1T0R4-H/2/424366c045f4da0e836ca0dd3dfcce1c)
Abstract:
Control of physical and mechanical properties of biopolymer (derived from food hydrocolloid) porous solids in terms of stress strain relationship during compression, porosity and pore size

would enable their use for a wider range of purposes. Different types of dried cellular biopolymer foams were produced using different food hydrocolloids such as locust bean and alginate gums, gelatin, low and high methoxy pectin, methyl cellulose and starches (corn and tapioca) at various proportions. First different types of wet hydrogels were prepared by varying gel processing methods. Then they dried using microwave energy under vacuum called vacuum microwave drying. Before performing the drying process the initial Young's modulus of the hydrogels was measured. Pore size analysis and distribution percentage were done using mercury pore size analyser after drying. Relationship between the pore size distribution after drying and the initial Young's modulus was developed. Compressive test was performed for dried porous solids and true stress strain relationship curves were developed to classify nature of dried foams obtained from various gel types. Scanning Electron Microscopic study of individual samples was performed to view the internal structure of dried porous biopolymers.
Keywords: vacuum microwave drying; Young's modulus; stress-strain curve; pore size; mercury pore size analyser

Plamen Mollov, Kiril Mihalev, Vasil Shikov, Nikolina Yoncheva, Vasil Karagyozov, Colour stability improvement of strawberry beverage by fortification with polyphenolic copigments naturally occurring in rose petals, Innovative Food Science & Emerging Technologies, Volume 8, Issue 3, 4th International Congress on Pigments in Food: Pigments in Food - A Challenge to Life Sciences, September 2007, Pages 318-321, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.03.004.
(http://www.sciencedirect.com/science/article/B6W6D-4NCSGPH-1/2/4fb6506c96d2276a8e2979840b604318)
Abstract:
Heat stability of strawberry anthocyanins was studied depending on the addition of polyphenolic copigments naturally occurring in rose (Rosa damascena Mill.) petals. The anthocyanin degradation ideally followed first-order reaction kinetics (R = 0.99) and the half-life value increased significantly due to the addition of rose petal polyphenolics. Further, CIELCH colour coordinates of thermally treated strawberry beverage were monitored depending on the fortification with polyphenolic copigments. Colour stability increased due to the addition of rose petal polyphenolics, as the total colour difference was smaller for the fortified beverage, especially after prolonged heating (4 h). The results obtained demonstrated that the addition of polyphenolic copigments extracted from distilled rose petals reduces the thermal degradation of strawberry anthocyanins, allowing improved colour stability of the processed strawberries. Moreover, this polyphenolic fortification could be worthwhile not only from technological point of view, but also with respect to the development of functional foods and beverages.Industrial relevance
This study presents a nature-derived concept to improve the quality of colour-labile strawberry products by fortification with polyphenolic copigments extracted from distilled rose petals. The approach suggested appears to be easily applicable at industrial scale. Additionally, the recovery of rose petal by-products rich in polyphenolics could be recommended, thus adding value to the rose processing industry.
Keywords: Strawberry beverage; Colour stability; Anthocyanins; Copigmentation; Rosa damascena

Ulla Kidmose, Lars P. Christensen, Sammy M. Agili, Shakuntala H. Thilsted, Effect of home preparation practices on the content of provitamin A carotenoids in coloured sweet potato varieties (Ipomoea batatas Lam.) from Kenya, Innovative Food Science & Emerging Technologies, Volume 8, Issue 3, 4th International Congress on Pigments in Food: Pigments in Food - A Challenge to Life Sciences, September 2007, Pages 399-406, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.03.025.
(http://www.sciencedirect.com/science/article/B6W6D-4NG3TBV-2/2/d0ba2723bc35ecad6a51ad0820bcfe22)

Abstract:
The content of [beta]-carotene was determined in raw peeled, boiled peeled and roasted peeled roots of six orange- and yellow-fleshed sweet potato varieties from Kenya to evaluate their vitamin A potential before and after household preparation. The boiling and roasting procedures were similar to traditional methods used in Kenya. Dried products, chips and flour, of the variety Zapallo were also analysed. The varieties differed in dry matter and [beta]-carotene content (1240-10,800 [mu]g/100 g fresh weight (FW)) and thus in vitamin A content (100-830 RE/100 g FW). As sweet potato roots are consumed after heating, the loss of all-trans-[beta]-carotene during preparation should be taken into account. Boiling of roots of the selected varieties seemed to result in a higher true retention (TR) of all-trans-[beta]-carotene than roasting and TR of all-trans-[beta]-carotene seemed to be dependent on the variety (42-128%). Preparation of chips by drying resulted in a significant reduction of the all-trans-[beta]-carotene content of approximately 21%, which was further reduced when flour was produced from chips. The varieties Tainung and SPK-004 can be recommended for consumption especially after boiling in order to enhance the vitamin A intake in Kenya. Both varieties have a high content of vitamin A, the losses after boiling are rather low and both varieties have high consumer acceptability.Industrial relevance
The content and stability of [beta]-carotene in sweet potato is an issue that is particularly important for developing countries with high prevalence of vitamin A deficiency. In order to prolong the shelf life of sweet potato, it is necessary to implement and develop industrial or small scale processing methods so that it is possible to produce sweet potato products with highest possible vitamin A values in these countries. In developed countries, focus is on innovation of new products with a good taste and a high health value. Consequently, sweet potato and sweet potato products might have a future as healthy foods in developed countries, and therefore there is a need to build up an industry that can provide the people in these countries with high quality sweet potato foods.
Keywords: [beta]-Carotene; Vitamin A; Retention; Boiling; Roasting; Drying

Damaso Hornero-Mendez, Maria Isabel Minguez-Mosquera, Bioaccessibility of carotenes from carrots: Effect of cooking and addition of oil, Innovative Food Science & Emerging Technologies, Volume 8, Issue 3, 4th International Congress on Pigments in Food: Pigments in Food - A Challenge to Life Sciences, September 2007, Pages 407-412, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.03.014.
(http://www.sciencedirect.com/science/article/B6W6D-4ND0RT0-3/2/9c0b7098afe86e386f187992a36bff2e)
Abstract:
Food processing and occurrence of dietary lipids are believed to be important and limiting factors for carotenoid bioavailability in humans. In the present study the isolated and combined effects of household cooking and addition of olive oil on the bioaccessibility of carotenes from carrots have been investigated. Although thermal treatment during cooking showed to have a negative impact on the carotenoid content, a positive effect on the micellarisation of carotenes and therefore on their bioaccessibility was found. Carotenes transferred to the digests were micellarised to a higher extent from cooked carrots (52%) than from crude carrots (29%). Addition of olive oil to carrot samples during cooking and before application of the in vitro digestion model had a marked positive effect on the release of carotenes, although the design of the model did not allow the correct estimation of this effect. The higher amounts of micellarised carotenes (80%) were found in the digest prepared from cooked carrots containing 10% olive oil. In general, the inclusion of olive oil during cooking increased the carotenoid extraction and micellarisation in a dose-dependent fashion. Although [beta]-carotene and [alpha]-carotene were affected in a similar way by the cooking process, [alpha]-carotene appeared to be more efficiently incorporated into the micelles when olive oil was added to the samples. In conclusion, both processing and mainly lipid content (cooking oil in this case) significantly improve carotenoid bioaccessibility from carrots, and therefore may increase bioavailability in humans.Industrial relevance

The consumption of carotenoid-rich foods such as fruits and vegetables has been associated with a decrease of the risk of developing certain types of degenerative and chronic diseases. Processing of food and the interaction of carotenoids with lipophilic food components or ingredients may modify the amount of the released pigment from the food matrix, and therefore potentially increase or decrease their bioavailability. For this purpose, in the present study we have investigated the effects of cooking and presence of olive oil on the release of carotenes from carrots (as a model food) and their incorporation into absorbable micelles, the bioaccessibility. From the industrial point of view, a better understanding of the factors governing the release of carotenoids and other active components from vegetable foods is of great importance with the aim of optimising the manufacturing processes.
Keywords: Carotenes; Bioaccessibility; Bioavailability; In vitro digestion; Carrots; Olive oil

Alan Mortensen, Asger Geppel, HPLC-MS analysis of the green food colorant sodium copper chlorophyllin, Innovative Food Science & Emerging Technologies, Volume 8, Issue 3, 4th International Congress on Pigments in Food: Pigments in Food - A Challenge to Life Sciences, September 2007, Pages 419-425, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.03.018.
(http://www.sciencedirect.com/science/article/B6W6D-4ND0RT0-8/2/7225f23986dbffa3155c677d7158f003)
Abstract:
Five commercial samples of sodium copper chlorophyllin, a green food colorant, were analysed by high-performance liquid chromatography (HPLC) using diode-array detection (DAD) and mass spectrometry (MS). Some of the constituents were identified using authentic standards, whereas others were identified tentatively based on their absorption spectra and mass data. The composition of three of the samples was very similar, whereas the other two were quite different. In the three former samples, the three largest peaks could be assigned to Cu chlorin e6, Cu chlorin p6, and Cu isochlorin e4. In one of the two other samples, these three compounds were also among the largest peaks, whereas Cu chlorin e6 was a small peak in the last sample and Cu chlorin p6 was absent altogether. Porphyrins were also present in the samples, while except in one of the samples chlorins derived from chlorophyll b were largely absent.Industrial relevance
Sodium copper chlorophyllin is a green food colorant made from chlorophyll. Sodium copper chlorophyllin is made by saponifying chlorophyll and coppering the resulting product. This processing leads to a complex mixture of compounds. An analytical method was developed that can be used to identify many of these compounds and show the extent of coppering and degradation of sodium copper chlorophyllin, which may be used industrially to optimize the production of sodium copper chlorophyllin.
Keywords: High-performance liquid chromatography; Mass spectrometry; Sodium copper chlorophyllin

Alfonso Ranalli, Mario Benzi, Tommaso Gomes, Debora Delcuratolo, Donato Marchegiani, Lucia Lucera, Concentration of natural pigments and other bioactive components in pulp oils from de-stoned olives, Innovative Food Science & Emerging Technologies, Volume 8, Issue 3, 4th International Congress on Pigments in Food: Pigments in Food - A Challenge to Life Sciences, September 2007, Pages 437-442, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.03.020.
(http://www.sciencedirect.com/science/article/B6W6D-4ND0RT0-B/2/7fb6776ed3802712b9114b87b9de25c9)
Abstract:
De-stoned olives (Gentile di Chieti, Caroleo and Coratina varieties) were processed in comparison with non-stoned olives (traditional extraction). Since the de-stoned oily pastes are not easy to process, a depolymerising pectocellulolytic enzyme preparation (in combination or not with draining micronised food talc) was added to them. These processing aids significantly improved the lower oil yields given by the new extraction system. Destoning increased the hourly plant

processing potential of approximately 20%. In addition, it allowed to obtain separated by-products (better recyclable in chemical or feedstuff industries) and to produce highly nutraceutical oils, characterised by higher contents of hydrophilic biophenols, tocopherols and volatiles. On the contrary, the de-stoned oils had lower concentrations of pigments (both carotenoids and chlorophylls). They were chiefly valuable for the marked and harmonic aroma, the green fruitiness notes and the potentially higher preservability (shelf-life) and resistance to autoxidation. This could lead to economically prefer the new extraction system to the classical industrial processing cycles.Industrial relevance
Because of high bioactivity level of the de-stoned oil and of its high market price, the new olive oil extraction system, consisting in processing de-stoned olives, is already being used by some European industrial oil mills even though the oil yields are lower with respect to the traditional systems. It is expected that through incorporation into the de-stoned oily paste of olive processing aids, such as the officially recognised micronised food talc and/or the exogenous pectocellulolytic enzymes (whose official recognition could be near), a regular industrial application of the innovative extraction cycle will be made.
Keywords: De-stoned olive oil; Pigments; Tocopherols; Biophenolics; Aromas; Chemometrics

Yu-Long Gao, Xing-Rong Ju, Statistical prediction of effects of food composition on reduction of Bacillus subtilis As 1.1731 spores suspended in food matrices treated with high pressure, Journal of Food Engineering, Volume 82, Issue 1, September 2007, Pages 68-76, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.01.019.
(http://www.sciencedirect.com/science/article/B6T8J-4N0X5J3-1/2/710cfcbac5da2109ad840665b0b3ec0d)
Abstract:
Our formerly published experimental results of studies on inactivation of Bacillus subtilis As 1.173 spores by high hydrostatic pressure and heat using design of experiments showed that the optimum process parameters for a six log-cycle reduction of spores of B. subtilis were obtained as: pressure, 576.0 MPa; temperature, 87 [degree sign]C; and pressure holding time, 13 min. Based on the results, response surface methodology (RSM) was performed in the present investigation, to determine effects of food composition (soybean protein, bean oil, sucrose) and pH on the inactivation of B. subtilis As 1.173 spores by high pressure and mild heat were studied. A quadratic predictive model was built for the effects of food compositions and pH on the reduction levels of B. subtilis spores by HPP using RSM. The experimental results showed that the reduction of B. subtilis spores in buffer and foods differed depending on the HPP treatment process parameters. The soybean protein ($P = 0.0005$), sucrose ($P = 0.0003$), and pH ($P = 0.0080$) significantly influenced the reduction of B. subtilis spores, and the effect of bean oil on the reduction of B. subtilis spores was only slightly significant ($P = 0.0810$). Moreover, the adequacy of the model equation for predicting the reduction of B. subtilis spores was verified effectively using experimental test data that was not used in the development of the model.
Keywords: High pressure processing (HPP); Inactivation of B. subtilis spores; Food compositions; Predictive model

H.N. Lazarides, G.E. Mitrakas, K.I. Matsos, Edible coating and counter-current product/solution contacting: A novel approach to monitoring solids uptake during osmotic dehydration of a model food system, Journal of Food Engineering, Volume 82, Issue 2, September 2007, Pages 171-177, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.007.
(http://www.sciencedirect.com/science/article/B6T8J-4N2KT65-5/2/5e1be6f9355049965a6e492d860259de)
Abstract:
In an effort to explore a novel approach to monitoring solids uptake during osmotic dehydration, the combination of product coating with alternative scenarios of product/solution contacting ('flow')

was investigated. Potato was used as a model plant material for short term (i.e. 3 h) osmotic treatment in a series of sucrose solutions with decreasing or increasing concentrations to simulate co-current or counter-current product/solution contacting (flow), respectively. A mixed-level full factorial experimental design was used. Data were analyzed using multiple linear regression procedures. Counter-current product/solution contacting contributed to faster water loss and slower solids uptake. In both flow-types, initial solids had a significant impact on both water loss and solids uptake. Sodium alginate coating yielded significantly decreased solids uptake, without negatively affecting water removal. Overall, 'dehydration efficiency' was drastically improved (up to 77%) by combined coating and counter-current contacting. Regression models were developed to predict mass exchange (i.e. water loss and solids uptake) under alternative treatment scenarios, considering initial product solids.
Keywords: Osmotic dehydration; Osmotic processing; Osmotic treatment; Product/solution contacting; Counter-current flow; Co-current flow; Edible coating; Solids uptake; Solid gain; Potato; Initial product solids

Eva Balsa-Canto, Maria Rodriguez-Fernandez, Julio R. Banga, Optimal design of dynamic experiments for improved estimation of kinetic parameters of thermal degradation, Journal of Food Engineering, Volume 82, Issue 2, September 2007, Pages 178-188, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.006.
(http://www.sciencedirect.com/science/article/B6T8J-4N2KT65-6/2/fcf653fd5cb90ea21a678fd080d3aeaf)
Abstract:
Thermal processing is widely used for ensuring food safety and extended shelf life. However, standard methods of thermal processing have a significant impact on food quality due to thermal degradation of nutrients and other quality factors. Model-based methods can be successfully used for thermal process design, optimization and control. However, building sound models requires suitable estimation of the unknown kinetic parameters. Further, the accuracy of these estimates will largely depend on the quality and quantity of the available experimental data.
Optimal experimental design (OED) of dynamic experiments allows for the calculation of the scheme of controls and measurements which improve the estimation of model parameters. In this contribution, the OED problem is formulated as a general dynamic optimization problem where the objective is to find those experimental conditions which result in maximum information content, as measured by the Fisher information matrix. The numerical solution of this problem is then approached using a combination of the control vector parameterization approach with a non-linear global optimization solver.
As an illustrative application, we consider the optimal experimental design for the parameter estimation of the thiamine degradation kinetic parameters during the thermal processing of canned tuna. Results confirm that the use of optimal dynamic experiments not only improves identifiability but also results in reduced confidence regions for the parameters (a maximum error of the 2% in the parameter estimates), substantially decreasing the experimental effort (up to a 50%). Particularly the use of six optimally designed experiments results in a 30% reduction of the confidence regions with respect to previously published results using 10 typical experiments.
Keywords: Optimal experimental design; Thermal processing; Thermal degradation kinetics; Parameter estimation

S.O. Jekayinfa, J.O. Olajide, Analysis of energy usage in the production of three selected cassava-based foods in Nigeria, Journal of Food Engineering, Volume 82, Issue 2, September 2007, Pages 217-226, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.003.
(http://www.sciencedirect.com/science/article/B6T8J-4N2KT65-8/2/a8261908b3a21f280a5b90ad735bb23f)
Abstract:

A study was conducted in 18 cassava processing mills situated in the southwestern part of Nigeria to investigate the energy utilization pattern in the production of three different cassava products, viz: `gari', cassava flour and cassava starch. Six mills specializing in the production of each of the products were randomly selected for investigation. The computation of energy use was done using the spreadsheet program on Microsoft Excel. Optimization models were developed to minimize the total energy input into each production line. The results of the study showed that the observed energy requirements per tonne of fresh cassava tuber for production of gari, starch and flour were 327.17, 357.35 and 345 MJ, respectively. The study identified the most energy-intensive operations in each production line and concluded from optimization results that the total minimum energy inputs required for the production of gari, cassava starch and cassava flour per tonne of fresh cassava tuber were 290.53, 305.20 and 315.60 MJ, respectively.
Keywords: Cassava products; Energy requirement; Unit operation; Optimization models

Saralees Nadarajah, Comments on 'Effects of processing on shear rate of yoghurt' by G. Mullineux and M.J.H. Simmons, Journal of Food Engineering, 79 (2007) 850-857, Journal of Food Engineering, Volume 82, Issue 2, September 2007, Pages 268-269, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.02.001.
(http://www.sciencedirect.com/science/article/B6T8J-4N1T1HG-1/2/3999e4891f52ed3059890d8e7f8971b0)
Abstract:
Exact and explicit expressions are derived for the two integrals used in the main calculations of Mullineux and Simmons.
Keywords: Beta function; Gamma function; Incomplete beta function; Yoghurt

Nour-Eddine Es-Safi, Albert Kollmann, Samira Khlifi, Paul-Henri Ducrot, Antioxidative effect of compounds isolated from Globularia alypum L. structure-activity relationship, LWT - Food Science and Technology, Volume 40, Issue 7, September 2007, Pages 1246-1252, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.08.019.
(http://www.sciencedirect.com/science/article/B6WMV-4M51FS6-1/2/6db22da835b7ecca0763ddcc7f52fd69)
Abstract:
The antioxidant activity of the Globularia alypum phytochemicals were evaluated for their capacity to scavenge the 1,1-diphenyl-2-dipicrylhydrazyl (DPPH[degree sign]) free radical and some structure-activity relationships were obtained. Assay guided fractionation led to the isolation of syringin, four phenylethanoids, four flavonoids and six iridoids as the main constituents of the extract and their antioxidant activity was determined. The obtained results showed that the activity towards the DPPH[degree sign] free radical was mainly due to the flavonoid and phenyl ethanoid constituents which were most active free radical scavengers than iridoids. Among the tested flavonoids, 6-hydroxyluteolin glycosides showed the strongest activity, suggesting that the presence of the 6-hydroxyl group was a favourable structural feature of flavonoids with regard to DPPH[degree sign] scavenging effect. The isolated phenylethanoid glycosides all showed potent antioxidant activity and their capacity to scavenge free DPPH[degree sign] radical was greater than BHT. Their high antioxidant activity could be attributed to the caffeoyl moieties contained in them, while iridoids showed moderate free radical scavenging activity. The obtained results demonstrated that some of the isolated compounds play an important role for the antioxidant activity of G. alypum and give a scientific basis to the use of this plant in traditional medicine. The hydromethanolic extract of G. alypum could thus be considered as a source of potential antioxidants and will promote the reasonable usage of this plant in food technology and processing as well as for medical use.
Keywords: Antioxidant activity; Radical scavenging; Flavonoids; Phenylethanoids; Iridoids; DPPH[degree sign]; Globularia alypum; Globulariaceae

Stacy L. Kim, Andrew Thurber, Kamille Hammerstrom, Kathleen Conlan, Seastar response to organic enrichment in an oligotrophic polar habitat, Journal of Experimental Marine Biology and Ecology, Volume 346, Issues 1-2, 3 August 2007, Pages 66-75, ISSN 0022-0981, DOI: 10.1016/j.jembe.2007.03.004.
(http://www.sciencedirect.com/science/article/B6T8F-4NM5SJ9-1/2/6d2fa46dccca7fc8aad98f191c738db4)
Abstract:
The high Antarctic marine system, including McMurdo Sound, is food limited. Benthic scavengers, especially the seastar Odontaster validus, respond rapidly to sources of organic material, however, fecal material from the McMurdo Station sewage outfall is not consumed. Laboratory and field experiments showed that O. validus responded quickly (within hours) to organically enriched sediments, but that the presence of the anaerobic bacteria Beggiatoa spp. modified seastar behavior. In the lab, anoxic sediments, even more strongly than the presence of Beggiatoa, caused seastar avoidance. In the field, Beggiatoa caused seastar avoidance even of organically enriched sediments. The large mass of organic material remaining from pre-sewage treatment years at the McMurdo outfall is currently completely covered by a thick Beggiatoa microbial mat. O. validus and other megafaunal scavengers are abundant nearby but do not feed on the sewage organics that are covered by the microbes. The outfall deposit is thus likely to exist for a long period of time, undergoing slow anaerobic microbial degradation rather than rapid processing by megafaunal scavengers. This is an example of competition between constituents of the microbial and megafaunal communities and espouses the need for an ecosystem approach to ecology rather than community analysis within a limited size class (i.e. mega-, macro-, meio-, or micro-fauna).
Keywords: Anoxic; Antarctica; Beggiatoa; Microbial; Odontaster validus; Sewage

S.J. Hur, G.B. Park, S.T. Joo, Formation of cholesterol oxidation products (COPs) in animal products, Food Control, Volume 18, Issue 8, August 2007, Pages 939-947, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.05.008.
(http://www.sciencedirect.com/science/article/B6T6S-4KY88HM-1/2/07356f3d1bbef5ff8c6c0ec9548d3e8a)
Abstract:
The cholesterol oxidation products (COPs) are related to processing temperature, heating time, storage conditions, level of activator present, packaging and most of the COPs found in foods were subjected to processing conditions or exposure to heat. The hydroperoxides of polyunsaturated fatty acid formed during lipid oxidation may be necessary to initiate cholesterol oxidation. The amount of COPs in foods could frequently reach 1% of total cholesterol and occasionally 10% or more. The most predominant oxidized cholesterol detected was 7-ketocholesterol, as well as [beta]-epoxycholesterol and [alpha]-epoxycholesterol. COPs have been known to be more injurious to arterial cells than pure cholesterol and are more directly connected to the development of atherosclerosis and coronary heart disease, and the lipid oxidation has been associated with quality deterioration caused by the development of off-flavors and off-odors during storage. Prevention of cholesterol oxidation in processed foods should be similar to procedures to prevent lipid oxidation. Overall, the formation of COPs in animal products can be minimized by the application of low processing temperatures, that is through minimal processing, by the use of oxygen-proof packaging and a protective atmosphere as well as by low-temperature and light-free storage, by the dietary antioxidants to animals or antioxidants addition to foods.
Keywords: Cholesterol; Oxidation; Lipid; Fatty acid; Animal products

U. Nufer, R. Stephan, T. Tasara, Growth characteristics of Listeria monocytogenes, Listeria welshimeri and Listeria innocua strains in broth cultures and a sliced bologna-type product at 4

and 7 [degree sign]C, Food Microbiology, Volume 24, Issue 5, August 2007, Pages 444-451, ISSN 0740-0020, DOI: 10.1016/j.fm.2006.10.004.
(http://www.sciencedirect.com/science/article/B6WFP-4MHPHK8-2/2/720d1eedfc4c13326fca694302671c19)
Abstract:
The growth characteristics of meat processing plant-derived field strains of Listeria monocytogenes, L. welshimeri and L. innocua were analyzed. The strains were inoculated in BHI broth cultures and incubated at 4 and 7 [degree sign]C. Growth curves were determined by colony counting for 28 days. Significant variations were detected in the growth properties of these field-derived strains. In particular some of the L. monocytogenes strains displayed better cold stress tolerance. These discrepancies in growth behavior were more apparent in the cultures at 4 [degree sign]C compared to 7 [degree sign]C. Similar growth characteristics were observed for selected L. monocytogenes strains also in food challenge tests based on a sliced bologna-type product. The results stress the need for more evaluation of field strain growth characteristics and incorporation of such information in relevant predictive microbial growth models for L. monocytogenes risk assessment in naturally contaminated food products.
Keywords: Listeria spp.; Growth characteristics; 4 [degree sign]C; 7 [degree sign]C

Kritsna Siripon, Ampawan Tansakul, Gauri S. Mittal, Heat transfer modeling of chicken cooking in hot water, Food Research International, Volume 40, Issue 7, August 2007, Pages 923-930, ISSN 0963-9969, DOI: 10.1016/j.foodres.2007.03.005.
(http://www.sciencedirect.com/science/article/B6T6V-4NDDM05-2/2/159284500d0afe9c02312d939b3f2441)
Abstract:
To calculate the slowest heating point and optimum cooking time of whole chicken cooking in hot water, a 2-dimensional heat transfer model was developed to predict temperature profile and history of the chicken cooked in hot water at 85, 90 and 95 [degree sign]C. Chickens were divided into 12 sections and the heat transfer model was applied to each cross section. These models were solved with an I-DEAS program. Specific heat and thermal conductivity were measured at temperatures ranging from 25 to 95 [degree sign]C. The temperature of chicken did not significantly affect the thermal properties. The average values of specific heat of white and dark meats were 3.521 and 3.654 kJ/(kg K), respectively, and the average thermal conductivity values were 0.5093 and 0.4930 W/(m K), respectively. The model was validated against experimental results, and provided an average root mean square error of 2.8 [degree sign]C. Temperature distributions showed that the slowest heating point was deep in the breast part of the second cross section (3.6 cm far from shoulder) at the symmetric line of the chicken, around 2.1-2.5 cm deep from breast skin. For food safety consideration, the recommended cooking times, for whole chickens in weight range of 2.3-3.2 kg with different initial temperatures (5-30 [degree sign]C), were around 74-84, 64-74 and 57-67 min for cooking temperatures of 85, 90, and 95 [degree sign]C, respectively.
Keywords: Chicken cooking; Finite difference analysis; Process modeling; Process simulation; Hot water cooking; Thermal process design; Thermal processing

S. Chethana, Chetan A. Nayak, K.S.M.S. Raghavarao, Aqueous two phase extraction for purification and concentration of betalains, Journal of Food Engineering, Volume 81, Issue 4, August 2007, Pages 679-687, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.12.021.
(http://www.sciencedirect.com/science/article/B6T8J-4MVN0V6-1/2/1d107438c6db978bb340d5d9b2702777)
Abstract:
As a natural food colorant, betalains are finding increased importance. The presence of free sugars accelerates the degradation of betalains, hence it is desirable to separate the sugars from

the beet extract. Aqueous two-phase extraction was employed for the first time as an attractive alternative for the downstream processing of betalains, mainly for the removal of sugars without the need of additional steps. The effect of different parameters such as tie line length, phase volume ratio, concentration of phase forming components on the partitioning behavior of betalains was studied. The differential partitioning of betalains and sugars was achieved in aqueous two phase extraction at higher tie line length (34%), wherein betalains (about 70-75%) and sugars (about >90%) are partitioned in the top and bottom phases, respectively. Further, the betalains was successfully separated from the polymer employing organic-aqueous extraction resulting in 3.4 fold increase in concentration.
Keywords: Betalains; Aqueous two-phase extraction; Partition coefficient; Sugars; Relative free volume; Differential partitioning

Tom Humphrey, Sarah O'Brien, Mogens Madsen, Campylobacters as zoonotic pathogens: A food production perspective, International Journal of Food Microbiology, Volume 117, Issue 3, 15 July 2007, Pages 237-257, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.01.006.
(http://www.sciencedirect.com/science/article/B6T7K-4N0PPRG-1/2/228a013cd7ef02d9865e2b7f45080eb0)
Abstract:
Campylobacters remain highly important zoonotic pathogens worldwide which infect an estimated 1% of the population of Western Europe each year. Certain campylobacters are also important in infections of animals, particularly of the reproductive tract, and some are involved in periodontal disease. This paper focuses, however, on the two species which are most important in food-borne infections of humans, Campylobacter (C.) jejuni and C. coli. Infection with these campylobacters is serious in its own right but can also have long-term sequelae such as reactive arthritis and Guillain-Barre syndrome. The pathogens are ubiquitous in nature and in domestic animals and, as a consequence, are found frequently in the environment and on many raw foods, of both plant and animal origin and bacterial numbers can be very high on certain key foods like raw poultry meat. Although all commercial poultry species can carry campylobacters, the risk is greater from chicken because of the high levels of consumption. Campylobacters are relatively `new' zoonotic pathogens as routine culture from clinical specimens only became possible in the late 1970s. As a consequence there is much that still needs to be understood about the behaviour and pathogenicity of these highly important bacteria. In particular, and from a food industry/food safety perspective, it is important to better understand the behaviour of C. jejuni and C. coli in the food production environment, and how this affects their ability to survive certain food production processes. There is a belief that campylobacters are much more sensitive to hostile conditions than either salmonellas or Escherichia coli. Much of data to support this view have been derived from laboratory experiments and may not fully represent the natural situation. Studies are showing that campylobacters may be more robust than previously thought and thus may represent a greater challenge to food safety.
We recommend that research is undertaken to better understand how campylobacters behave in the food chain and how responses to relevant conditions affect their ability to survive processing and their virulence. There is also a need to better understand the reasons why campylobacters are capable of frequent change, particularly in the expression of surface antigens.
Keywords: Campylobacters; Zoonotic pathogens; Food production

Yu-Long Gao, Xing-Rong Ju, Wu-Ding, A predictive model for the influence of food components on survival of Listeria monocytogenes LM 54004 under high hydrostatic pressure and mild heat conditions, International Journal of Food Microbiology, Volume 117, Issue 3, 15 July 2007, Pages 287-294, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.04.008.
(http://www.sciencedirect.com/science/article/B6T7K-4NK4G0W-2/2/ad43847d3e57ca99eea08535068d9de0)

Abstract:
The combination of high hydrostatic pressure with mild temperature was explored to achieve a predictive model of microbial inactivation in food matrix processing. The pressure processing conditions were fixed at 448 MPa for 11 min at the treatment temperature of 41 [degree sign]C, which have been determined as the optimum processing conditions considering six log-cycle reductions of Listeria monocytogenes. Based on the results, response surface methodology (RSM) was performed in the present work, the influence of food components like soybean protein (0-5.00%), sucrose (0.25-13.25%), bean oil (0-10.00%), and pH (4-10) of the food matrix on survival of L. monocytogenes by high pressure and mild heat was studied, and a quadratic predictive model for the influence of food components and pH of food matrix on L. monocytogenes reduction by high pressure and mild heat was built with RSM accurately. The experimental results showed that the efficiency of L. monocytogenes reduction in milk buffer and food matrix designed in the present work, under the HPP treatment process parameters described above, were different. The soybean protein ($P = 0.0086$), sucrose ($P < 0.0001$), and pH ($P = 0.0136$) significantly affected reduction of L. monocytogenes, but the effect of bean oil on reduction of L. monocytogenes was not significant ($P = 0.1028$). The predictive model is significant since the level of significance was $P < 0.0001$ and the calculated F value (11.53) is much greater than the tabulated F value ($F_{0.01}(14, 5) = 9.77$). Moreover, the adequacy of the predictive model equation for predicting the level of L. monocytogenes reduction was verified effectively by the validation data.
Keywords: High pressure processing (HPP); Listeria monocytogenes (L. monocytogenes); Survival; Food components; Predictive model

S.E. Gilbert, R. Whyte, G. Bayne, S.M. Paulin, R.J. Lake, P. van der Logt, Survey of domestic food handling practices in New Zealand, International Journal of Food Microbiology, Volume 117, Issue 3, 15 July 2007, Pages 306-311, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.05.004.
(http://www.sciencedirect.com/science/article/B6T7K-4NRT35J-2/2/8b4ea51c60e0b1a42169ad67b4104b81)
Abstract:
The purpose of this survey was to obtain information on the domestic meat and poultry handling practices of New Zealanders in order to support the development of quantitative risk models, as well as providing data to underpin food safety campaigns to consumers. A sample of 1000 New Zealand residents, over 18 years of age, were randomly selected from the electoral roll and asked to participate in a national postal food safety study during 2005. Three hundred and twenty six respondents completed and returned questionnaires containing usable answers, and most of these respondents `always' prepared the main meal within the household. The majority of meat (84.6%) and poultry (62.9%) purchased by New Zealanders was fresh (rather than frozen), and most consumers (94.4%) claimed that the time taken from food selection to reaching their home was 1 h or less. The majority (approximately 64%) of fresh meat and poultry was frozen in the home and the most favoured method of thawing was at room temperature for up to 12 h. The most common time period for storing cooked or raw meat and poultry in domestic refrigerators was up to 2 days. Most survey respondents preferred their meat and poultry to be cooked either medium or well done. The most popular cooking method for chicken was roasting or baking, while most respondents preferred to pan-fry steak/beef cuts, minced beef or sausages/hamburgers. The potential for undercooking was greatest with pan-fried steak with 19.8% of respondents preferring to consume this meat raw or rare. In answer to questions relating to food handling hygiene practices, 52.2% of respondents selected a hand washing sequence that would help prevent cross contamination. However, it was estimated that 41% and 28% of respondents would use knives and kitchen surfaces respectively in a manner that could allow cross contamination. The data in this survey are self-reported and, particularly for the hygiene questions, respondents may report an answer that they perceive as being correct rather than reflecting their actual behaviour.

Nevertheless, the data on food processing, transport, storage and cooking preferences represent useful inputs into the assessment of food safety along the meat and poultry food chains.
Keywords: Domestic food handling; New Zealand; Quantitative risk models; Risk communication

Gunter Klein, Lutz Beckmann, Harald Mike Vollmer, Edda Bartelt, Predominant strains of thermophilic Campylobacter spp. in a german poultry slaughterhouse, International Journal of Food Microbiology, Volume 117, Issue 3, 15 July 2007, Pages 324-328, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.04.011.
(http://www.sciencedirect.com/science/article/B6T7K-4NK4G0W-8/2/5ca9c35074b5161f2bcf4664fe5daaec)
Abstract:
Campylobacter causes bacterial diarrhoea in man and is a common foodborne pathogen, that has been associated mainly with poultry carcasses and processed poultry products as well as with drinking water. Genotyping of Campylobacter spp. from poultry was done in order to prove if predominant stable strains in the food chain are present. The influence of the slaughter process on the stability should be determined. Thermophilic Campylobacter spp. from eight poultry flocks were isolated from cloacal swabs, carcasses and offal at different abattoir processing steps to determine their stability. DNA-fingerprinting was done using Pulsed-Field Gel Electrophoresis (PFGE) with two enzymes (SmaI and KpnI) and ribotyping. More than 150 Campylobacter strains were ribotyped and these data were combined with the results of PFGE. Molecular typing showed that strains found in cloacal swabs before processing could also be isolated from carcasses and offal at different processing steps representing predominating stable strains. Strains with varying molecular pattern could additionally be detected at different processing steps. Both genotyping methods identified in agreement flock-specific strains. These remained stable through the slaughter of poultry and were not altered through the slaughter process. Despite the known genetic variability of thermophilic Campylobacter, stable predominant strains could be identified in the poultry slaughter process and those strains can thus enter the food chain.
Keywords: Campylobacter jejuni; Campylobacter coli; Poultry; genotyping; Pulsed-field gel electrophoresis; Ribotyping

Zaheera Parveen, John F. Kennedy, Da-Wen Sun (Ed.), Emerging technologies for food processing, Elsevier Academic Press, San Diego, CA, USA, 2005 (xvii+771 pp., [pound sign]100.00, ISBN: 0-12-676757-2)., Carbohydrate Polymers, Volume 69, Issue 4, 2 July 2007, Page 812, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.02.005.
(http://www.sciencedirect.com/science/article/B6TFD-4N25VT7-3/2/bd803921479c6967021c1ed1768116ca)

W.H. Kaye, U.F. Bailer, A. Wagner, G.K. Frank, Brain imaging studies: New insights into puzzling symptoms in anorexia nervosa., Appetite, Volume 49, Issue 1, July 2007, Page 302, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.03.103.
(http://www.sciencedirect.com/science/article/B6WB2-4P5SCRM-38/2/76630c5ed20a655865e367a592c61c1a)
Abstract:
People with anorexia nervosa (AN) have many puzzling symptoms. For example, restricted eating but an obsessive interest in food, anxiety and harm avoidance, relentless exercise, denial of illness, and resistance to treatment. In addition, little in life is rewarding, aside from the pursuit of weight loss. New brain imaging studies in AN, using fMRI and PET, are making substantial progress on understanding mechanisms that may contribute to altered reward, anxiety, and appetite modulation. For example, fMRI studies show that individuals with AN have altered response to the taste of sugar or water in insula and related regions thought to modulate higher-order appetitive function. In addition, they have altered reward processing in ventral

striatum/dopamine pathways. Moreover, PET studies show increased binding of dopamine D2/D3 receptors in these regions, supporting a disturbance of 'reward'-related function. In contrast, fMRI studies show that there is exaggerated activation of caudate and related cortical regions which may constitute an attempt at `strategic' (as opposed to hedonic) means of responding to stimuli, and/or exaggerated anxiety, perhaps reflecting oversensitivity to uncertainty. In summary, individuals with AN may have a bias in information processing, with less ability to attend to the here and now, but increased traffic in neurocircuits concerned with planning and consequences. This knowledge is important to clinicians because it provides new insights into the reason for the puzzling symptoms in AN, which in turn improves the ability to understand and empathize with the struggles inherent in this disorder.

B.S. Kopf, N. Geary, W. Langhans, L. Asarian, Intraperitoneal (ip) bacterial lipopolysaccharide (LPS) elicits rapid, graded increases in c-Fos expression in the raphe pallidus nucleus (rpa) and central nucleus of the amygdala (cea) in male rats, Appetite, Volume 49, Issue 1, July 2007, Page 304, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.03.110.
(http://www.sciencedirect.com/science/article/B6WB2-4P5SCRM-3H/2/ee794c0b1d2e343f6798bd221851f3f9)
Abstract:
LPS, a potent activator of the innate immune system, is commonly used to investigate the acute phase response to infection, including anorexia. We investigated the association between the intensity of LPS anorexia and (1) the activation of brain sites initially responding to LPS, measured with c-Fos expression, and (2) co-localization of c-Fos responses with tyrosine hydroxylase (TH), a marker of catecholaminergic (CA) neurons, in the A1 noradrenergic cells (A1). Male Long-Evans rats received 1 ml/kg ip injections of 0, 12.5 or 100 [mu]g/kg LPS at dark onset. Food intake was measured in one set of rats, and c-Fos and its co-localization with TH in another, unfed set 90 min post-injection. LPS reduced 120 min food intake in a significantly dose-related manner. LPS increased c-Fos expression in the A1, RPa, nucleus tractus solitarius, paraventricular nucleus, and CeA. C-Fos expression was dose-related, however, only in the RPa and CeA. LPS induced c-Fos in TH-positive neurons in the A1, but this was not dose-related. These results suggest that the dose-related effect of LPS on food intake (1) may originate in differential neuronal processing of LPS-induced signals in the RPa or CeA and (2) does not originate in CA neurons in the A1.

I.M.T. Nijs, I.H.A. Franken, P. Muris, Food cue-elicited brain potentials in obese and healthy-weight individuals., Appetite, Volume 49, Issue 1, July 2007, Page 317, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.03.147.
(http://www.sciencedirect.com/science/article/B6WB2-4P5SCRM-4V/2/5910530daf61674deaef3540852a700d)
Abstract:
In western societies the abundant availability of rewarding food is believed to contribute considerably to the current obesity epidemic. Obese individuals are assumed to be particularly sensitive and reactive to environmental food cues. Food cue reactivity suggests enhanced processing of food stimuli in the brain. Electrophysiological indices of information processing are event-related potentials (ERP). As is demonstrated in addiction and psychopathology research, amplitudes of long-latency ERPs (P3 and Late Positive Potentials [LPP]) are modulated by the motivational significance of processed information: in cue-exposure paradigms motivationally salient stimuli elicit larger ERP amplitudes than non-relevant stimuli. The present study investigated ERPs (P3, LPP, and an early ERP component between 150 and 300 ms) elicited by pictures of palatable foods and non-food control pictures in an obese (N=20, 4 males, BMI: 36.69+/-6.47 kg/m2, age: 28.65+/-6.59 yr) and normal-weight sample (N=20, 4 males; BMI: 22.68+/-1.53 kg/m2; age: 28.65+/-6.08 yr). Overall, significantly enlarged ERP amplitudes were observed for food cues as compared to non-food cues at lateral parietal-occipital and lateral

central-temporal electrode sites. Particularly parietal-occipital ERP amplitudes correlated positively with self-reported increase of food craving and physiological hunger during the exposure session. However, no differences between obese and normal-weight participants were observed. These findings demonstrate that food information is processed differently in the human brain as compared to non-food information, in a way that reflects the natural reinforcing value of food.

Daniel E. Martin, John Supan, Uma Nadimpalli, Steven G. Hall, Effectiveness of a heat/cool technique for shucking oysters, Aquacultural Engineering, Volume 37, Issue 1, Shucking of the American Oyster, Crassostrea virginica - Engineering Approaches and Solutions, July 2007, Pages 61-66, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2006.12.008.
(http://www.sciencedirect.com/science/article/B6T4C-4MWGFFR-1/2/17b0264dfa7fa1f5a30712d7c27e072b)
Abstract:
A method was developed to use heat/cool processes to effectively shuck oysters. The optimal method devised required only low-pressure steam and chilled water, thus providing a low cost and readily available solution to processors. A series of treatments were devised, and instrumentation installed to monitor process temperatures. Steam injection was used for heating, a vacuum pump was used to increase heating and chilling rates and an ice water solution was used for chilling. Sixty-seven different treatment combinations of both time-temperature and oyster location were tested on a total of 697 oysters. Release rates of up to 85% were observed. Coupling release rates with acceptable meat quality suggests optimal time-temperature combinations for the oysters studied (primarily from Louisiana and Mississippi coasts of the Gulf of Mexico) of 30 s pre-heat; 30 s steam injection at 30 psi; 30 s hold and 240 s ice water chill for these oysters. Variations among treatments suggest that this method of evaluation would be needed for different localities and oyster types, but still suggests that this methodology may potentially provide effective and inexpensive methods for automating oyster shucking.
Keywords: Oyster shucking; Food processing; Temperature control; Heat treatment; Process optimization

Byoung-Kwan Cho, Yud-Ren Chen, Moon S. Kim, Multispectral detection of organic residues on poultry processing plant equipment based on hyperspectral reflectance imaging technique, Computers and Electronics in Agriculture, Volume 57, Issue 2, July 2007, Pages 177-189, ISSN 0168-1699, DOI: 10.1016/j.compag.2007.03.008.
(http://www.sciencedirect.com/science/article/B6T5M-4NHD90H-2/2/d52eeb517ba51c373b6e7c49483105d4)
Abstract:
Diluted organic residues, such as feces, ingesta and other biological substances on poultry processing plant equipment surfaces, not easily discernible by human eye, are potential contamination sources for poultry carcasses. Development of sensitive detection methods for diluted organic residues is essential to ensure safe production of poultry carcasses. Hyperspectral imaging techniques have shown good potential for detecting the presence of fecal and other biological contaminants on food and processing equipment surfaces. In this study, the use of high spatial resolution hyperspectral reflectance is presented as a tool for selecting a few multispectral bands to detect diluted organic residues on the surface of materials used for manufacturing processing equipment. Reflectance imaging methods were explored for use in the detection of a range of diluted organic residues for both wet and dry conditions. Results showed that low concentrations of wet and dry residues, diluted up to 1:100 by weight with double distilled water, could be differentiated from stainless steel background with accuracies of 94.0 and 99.7%, respectively. Spectral bands determined in this study could be used for developing a multispectral inspection system for sanitation monitoring of poultry processing plants.
Keywords: Hyperspectral; Multispectral; Reflectance image; Fecal contamination

R. Simpson, A. Teixeira, S. Almonacid, Advances with intelligent on-line retort control and automation in thermal processing of canned foods, Food Control, Volume 18, Issue 7, Breakdowns in Food Safety, July 2007, Pages 821-833, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.04.006.
(http://www.sciencedirect.com/science/article/B6T6S-4JV447F-3/2/db18b2398fd441096099548e5f5fb1c2)
Abstract:
This paper presents a review of recent developments over the past 10 years that have further advanced the state of the art in improving food safety, quality and manufacturing efficiency in the canned food industry worldwide. The review focuses initially on retort control systems, and the various approaches that have been taken to help canned food processors accomplish on-line correction of unexpected process deviations, the major cause of lost productivity. Important features of each approach are discussed, along with suggested industry applications that would be appropriate for each method. The review also describes recent advances in industrial automation, including new retort systems for flexible and semi-rigid retortable packages, and automated materials handling systems for loading and unloading of batch retorts. The review concludes with a discussion of future trends to be expected in the industry.
Keywords: On-line control; Low acid foods; Batch retort; Process deviations

Andrea Corsi, Andrey Milchev, Vakhtang G. Rostiashvili, Thomas A. Vilgis, Interface stability and copolymers: Application to food systems, Food Hydrocolloids, Volume 21, Issues 5-6, Food Colloids 2006, July-August 2007, Pages 870-878, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.08.012.
(http://www.sciencedirect.com/science/article/B6VP9-4M2XFFR-2/2/3088d9cce6ba4023f0b405392aeced45)
Abstract:
The stability of oil-water or oil-air emulsions as well as egg white foams is one of the main food-technological problems. On the other hand, proteins are good natural stabilizers and emulsifiers which are widely employed in the technological processing. In this paper we have studied the localization of hydrophobic-polar (HP)-copolymers (which can be viewed as a simplified model for proteins) at a selective solvent-solvent interface. The sequences of the H- and P-species range from regular multiblocks to random and correlated structures. Our approach is based on simple scaling arguments and describes the dependence of the components of the gyration radius of the copolymer chain, perpendicular and parallel to the interface, on the chain length N, the block size M or the 'chemical correlation' length [xi], as well as the selectivity parameter [chi]. The scaling relations differ for the case of weak and strong localization. We implemented a dynamic off-lattice Monte-Carlo model to verify these scaling predictions and for a wide range of chain lengths (32[less-than-or-equals, slant]N[less-than-or-equals, slant]512) we find a really good agreement between the simulation results and the theoretical predictions. Some further perspectives and applications are shortly discussed.
Keywords: Copolymers; Fluid-fluid interfaces; Stabilization

Sarah Adams, Scott Singleton, Rimas Juskaitis, Tony Wilson, In-vivo visualisation of mouth-material interactions by video rate endoscopy, Food Hydrocolloids, Volume 21, Issues 5-6, Food Colloids 2006, July-August 2007, Pages 986-995, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.08.011.
(http://www.sciencedirect.com/science/article/B6VP9-4M3RPBJ-3/2/0cb54517b60172d8d4c8178299560415)
Abstract:

Results are reported for the first time on the use of an in-vivo fluorescence imaging technique to visualise residue in the oral cavity after oral processing of model fluid foods. A rigid rod endoscope is mounted such that all major axes of motion (pitch, yaw, roll, forward/reverse) can be exploited allowing comfortable viewing conditions for the subject during extended viewing periods. The technique has been applied to investigate the in-mouth behaviour, the distribution and clearance, of a range of homogeneous fluid foods in a subject. The results indicate that, for a range of different CMC solutions of varying citric acid content, viscosity is a key indicator for initial residue amount whereas salivary flow rate was shown to have little or no effect on initial deposited amount. However, salivary flow rate was found to have a strong influence on how quickly material was cleared from the oral cavity, with higher rates leading to faster clearance. The technique was also used to follow the in-mouth behaviour of bulk samples of corn and castor oil. Rapid emulsification on oral processing was observed, with smaller average droplet size observed for the lower viscosity oil. This work demonstrates the potential of this technique for investigating the range of processes that occur in the mouth during food processing and opens up new possibilities to increase our understanding of food material behaviour and its potential impact on the sensory perception of foods.
Keywords: In-vivo imaging; Fluorescence endoscopy; Food residue; Clearance

Marie-Laure Jalabert-Malbos, Anne Mishellany-Dutour, Alain Woda, Marie-Agnes Peyron, Particle size distribution in the food bolus after mastication of natural foods, Food Quality and Preference, Volume 18, Issue 5, July 2007, Pages 803-812, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2007.01.010.
(http://www.sciencedirect.com/science/article/B6T6T-4N206Y3-1/2/aa36a5213908c72500c86141978e0c1c)
Abstract:
The main goal of mastication is to prepare a food bolus suitable for deglutition. The bolus preparation consists in food breakdown and processing during which oral sensations are generated. This study was performed to examine the particle size distribution in the bolus formed by chewing 10 natural foods. Ten young subjects with normal dentition were asked to chew the food and to expectorate the bolus just before swallowing, while masticatory parameters were recorded. The particle size distribution of each bolus was evaluated by wet sieving. The number of cycles, sequence duration and masticatory frequency varied among subjects and foods. The particle size distributions differed among foods but were similar among subjects. The median particle size d50gave a range from 0.82 to 3.04 mm allowing a food classification based on the state of the bolus. The d50 value reflected the fracturability and may be useful to describe food behaviour in the mouth during bolus preparation.
Keywords: Mastication; Food bolus; Particle size; Natural foods; Sieving

Karluss Thomas, Corinne Herouet-Guicheney, Gregory Ladics, Gary Bannon, Andrew Cockburn, Rene Crevel, Julie Fitzpatrick, Clare Mills, Laura Privalle, Stefan Vieths, Evaluating the effect of food processing on the potential human allergenicity of novel proteins: International workshop report, Food and Chemical Toxicology, Volume 45, Issue 7, July 2007, Pages 1116-1122, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.12.016.
(http://www.sciencedirect.com/science/article/B6T6P-4MSHY35-1/2/f18da68562b600a1628e5db17954e987)
Abstract:
The ILSI Health and Environmental Sciences Institute Protein Allergenicity Technical Committee organized an international workshop in June 2006 in Estoril, Portugal, co-sponsored by the ILSI Research Foundation, ILSI International Food Biotechnology Committee and ILSI Europe. The objective was to discuss the effects of food processing on the allergenic potential of proteins and foods. The impact of food processing on the sensitization/induction phases of food allergy, and the

bioavailability of allergens to the immune system were presented. Studies evaluating the stability, digestibility, and allergenicity of processed food allergens were identified, and their complexity and limitations discussed. Participants agreed that investigating food allergy mechanisms, validating appropriate methods for identifying allergenic proteins, and refining strategies to assess and manage the risks from food allergy were important before processing considerations are integrated into public-health decision-making for novel proteins. Other factors may also play a role in food allergy and include: food matrix; multiplicity of epitopes; geographic variation in patterns/prevalence of food allergies; and genetic factors, but required further exploration. Food processing may increase or decrease the intrinsic allergenicity of a protein, but current data do not facilitate the identification of specific variables that could be used to reliably determine how processing will influence protein allergenicity.
Keywords: Food processing; Protein allergenicity; International workshop

Federica Aureli, Mauro Di Pasquale, Dario Lucchetti, Paolo Aureli, Ettore Coni, An absorption study of dietary administered acrylamide in swine, Food and Chemical Toxicology, Volume 45, Issue 7, July 2007, Pages 1202-1209, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.12.029.
(http://www.sciencedirect.com/science/article/B6T6P-4MSXT97-3/2/b361a131ed5e20173ffc4044010a146c)
Abstract:
Acrylamide is a food toxicant suspected to be carcinogenic to humans. It is formed in the heat processing of carbohydrate-rich food. A current issue in food safety is whether acrylamide actually represents a risk for human health. At present, available information is insufficient to reach any conclusions. Inter alias, a still unclear matter is the fraction of acrylamide ingested by food that is absorbed and metabolized. This study compared the in vivo relative absorption of acrylamide formed in cooked food with that of the pure compound dissolved in drinking water using the pig (25 Italian Large White females) as the animal model. Acrylamide intakes of about 0.8 and 8 [mu]g kg-1 pig body wt day-1 equal to one and ten times, respectively, the maximum average acrylamide daily intake for humans from the diet (expressed on a body wt basis) in industrialized countries, were chosen for the study. Adducts with the N-terminal valine of haemoglobin formed by acrylamide and its epoxide metabolite glycidamide, were used as exposure markers. Analyses were carried out by gas chromatography/mass spectrometry following in-house method validation. Both for the low and the high dose regimen, the glycidamide adduct levels in swine globins were lower of the limit of quantification of the method. As concerns acrylamide adducts, it was found that the relative absorption of acrylamide from feed and water was the same and that there is a direct proportionality between the adduct concentration and acrylamide intake.
Keywords: Acrylamide; Glycidamide; Haemoglobin adducts; Pigs

Yongliang Liu, Yud-Ren Chen, Moon S. Kim, Diane E. Chan, Alan M. Lefcourt, Development of simple algorithms for the detection of fecal contaminants on apples from visible/near infrared hyperspectral reflectance imaging, Journal of Food Engineering, Volume 81, Issue 2, July 2007, Pages 412-418, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.11.018.
(http://www.sciencedirect.com/science/article/B6T8J-4MR1JVF-4/2/2ed7c8367167e9d1472a1d510600f3c1)
Abstract:
Hyperspectral reflectance images of two cultivars of apples were acquired after fecal treatments at three different concentrations to explore the potential for the detection of fecal contaminants on apple surfaces. Region of interest (ROI) spectral features of fecal contaminated areas showed a reduction in reflectance intensity compared to those of uncontaminated skins. Large spectral differences between uncontaminated and fecal contaminated skins of two types of apples occurred in the 675-950 nm visible/NIR region, which provided the basis for developing universal algorithms in the detection of fecal spots. Comparison of a number of processed images revealed that a dual-

band ratio (Q725/811) algorithm could be used to identify fecal contaminated skins effectively. The result was most important as the two bands are away from the absorptions of natural pigments (such as chlorophylls and carotenoids), and hence can reduce the influence from color variations due to different apple cultivars.
Keywords: Hyperspectral imaging spectroscopy; Image processing; Algorithm; Principal component analysis; Apple; Fecal contamination; Food safety

A. Legrand, J.-C. Leuliet, S. Duquesne, R. Kesteloot, P. Winterton, L. Fillaudeau, Physical, mechanical, thermal and electrical properties of cooked red bean (Phaseolus vulgaris L.) for continuous ohmic heating process, Journal of Food Engineering, Volume 81, Issue 2, July 2007, Pages 447-458, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.11.024.
(http://www.sciencedirect.com/science/article/B6T8J-4MT54YF-3/2/529d340bb04a6dd823977ddb7b75a393)
Abstract:
Due to their complex composition and properties, the continuous thermal processing of solid-liquid mixtures (e.g. suspension of fragile particle in viscous carrier fluids) remains an empirical and random operation as compared to canning. Alternative technologies (e.g. ohmic heating) may achieve high-temperature treatment in a short time (HTST) but requires a perfect knowledge of thermo-physical and electrical properties of both particles and carrier fluid. Food properties are needed and play a significant role to predict and define the quality and behaviour of solid-liquid mixture. The properties of red beans (Phaseolus vulgaris L.) and a model non-Newtonian carrier fluid were studied throughout the duration of the process. Physical (rheological behaviour, density, shape and dimensions), mechanical (elasticity modulus, maximal deformation and stress) and thermal (heat capacity, thermal conductivity, thermal diffusivity) properties as a function of water content ranging from 11.6 to 67.4% w/w are reported. The electrical conductivity (electrical properties) was described as a function of the temperature and the solid concentration by a semi-empirical equation. The limiting factors to succeed a HTST for heterogeneous products in continuous thermal process were identified and discussed in the light of the properties of the foods involved. The large dispersion of particle mass volume had a simultaneous incidence of the suspension flow and the heat transfer. The volume expansion of particle (+22% between blanched and cooked bean) and the important loss of mechanical properties (-68% for elastic properties) constitutes unavoidable limiting factors inducing mechanical degradation and sometimes plugging of the duct. The electrical conductivity is strongly affected by a combined effect of temperature and solid concentration, which will induces irreversible heat treatment heterogeneity between particles. This work stresses that the continuous conventional or ohmic heating of these cooked dishes will be hard to achieve on an industrial scale.
Keywords: Red bean; Cooked dish; Physical; Mechanical and thermal properties; Electrical conductivity

Patrick Jackman, Da-Wen Sun, Liyun Zheng, Effect of combined vacuum cooling and air blast cooling on processing time and cooling loss of large cooked beef joints, Journal of Food Engineering, Volume 81, Issue 1, July 2007, Pages 266-271, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.10.026.
(http://www.sciencedirect.com/science/article/B6T8J-4MK60RS-5/2/05f8c8dd4f1876726e51c81aedf67871)
Abstract:
Experiments were carried out to test two combined cooling methods for their suitability in minimising the cooling loss and cooling time to 10 and 4 [degree sign]C of large cooked beef joints. The combined cooling methods were: vacuum cooling of the cooked joint to an intermediate temperature of 35, 30, 25, or 20 [degree sign]C and then air blast cooling to the final temperature of 4 [degree sign]C; and air blast cooling to an intermediate temperature of 35, 30, 25 or 20

[degree sign]C and then vacuum cooling to the final temperature of 4 [degree sign]C. It was found that the latter method was more effective at minimising the cooling loss with similar cooling loss to air blast cooling. Both methods were similar in optimising the cooling time to 10 [degree sign]C and could produce cooling times similar to the Irish and British recommended cooling times. Neither method could give a cooling time similar to vacuum cooling.
Keywords: Vacuum cooling; Air blast cooling; Beef; Meat; Food safety; Refrigeration; Combined cooling

Linda K. Massey, Food Oxalate: Factors Affecting Measurement, Biological Variation, and Bioavailability, Journal of the American Dietetic Association, Volume 107, Issue 7, July 2007, Pages 1191-1194, ISSN 0002-8223, DOI: 10.1016/j.jada.2007.04.007.
(http://www.sciencedirect.com/science/article/B758G-4P2M748-W/2/55925bb22367fbf92cf7a1f501c7d27f)
Abstract:
Food and nutrition professionals provide medical nutrition therapy for patients with kidney stones. If the stones contain oxalate or the patient has been diagnosed with hyperoxaluria, reduction of dietary oxalate may be appropriate. Differences in oxalate values for a single food may be due to analytical methods, and/or biological variation from several sources, including cultivar, time of harvest, and growing conditions. Bioavailability of food oxalate and, thus, urine oxalate, will also be affected by salt forms of oxalate, food processing and cooking methods, meal composition, and the presence of Oxalabacter formigenes in the patient's gut. Dietary advice for reducing urinary oxalate should include both reduction of dietary oxalate and simultaneous consumption of calcium-rich food or supplement to reduce oxalate absorption.

D. Rico, A.B. Martin-Diana, J.M. Barat, C. Barry-Ryan, Extending and measuring the quality of fresh-cut fruit and vegetables: a review, Trends in Food Science & Technology, Volume 18, Issue 7, July 2007, Pages 373-386, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.03.011.
(http://www.sciencedirect.com/science/article/B6VHY-4NFR53T-2/2/6213a488cbe13a4e395cd1dedf68c183)
Abstract:
The market sales of ready-to-use fresh vegetables have grown rapidly in recent decades as a result of changes in consumer attitudes, especially consumption of fresh-cut lettuce and carrot due to their use in prepared salads. Chlorine solutions have been widely used to sanitise fruit and vegetables in the fresh-cut industry. However, the association of chlorine with the possible formation of carcinogenic chlorinated compounds in water has called into question the use of chlorine in food processing. There is a real need to find alternatives for preservation of fresh-cut fruit and vegetables in order to improve the efficacy of washing treatments. Alternatives or modified methods have been proposed, as antioxidants, irradiation, ozone, organics acids, modified atmosphere packaging, whey permeate, etc.; however, none have yet gained widespread acceptance by the industry. For this reason the development of alternatives and markers in order to measure the efficacy of these alternatives are needed.

Jonathan Mosqueda-Melgar, Rosa M. Raybaudi-Massilia, Olga Martin-Belloso, Influence of treatment time and pulse frequency on Salmonella Enteritidis, Escherichia coli and Listeria monocytogenes populations inoculated in melon and watermelon juices treated by pulsed electric fields, International Journal of Food Microbiology, Volume 117, Issue 2, 30 June 2007, Pages 192-200, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.04.009.
(http://www.sciencedirect.com/science/article/B6T7K-4NK4G0W-9/2/c824449a5a81e8d4851445a35b8d364f)
Abstract:

Consumption of unpasteurized melon and watermelon juices has caused several disease outbreaks by pathogenic microorganisms worldwide. Pulsed electric field (PEF) has been recognized as a technology that may inactivate those bacteria present in fluid food products at low temperatures. Hence, PEF treatment at 35 kV/cm, 4 [mu]s pulse duration in bipolar mode and square shape were applied on Salmonella Enteritidis, E. coli and L. monocytogenes populations inoculated in melon and watermelon juices without exceeding 40 [degree sign]C outlet temperatures. Different levels of treatment time and pulse frequency were applied to evaluate their effects on these microorganisms. Treatment time was more influential than pulse frequency ($P <= 0.05$) on the PEF microbial reduction levels for both melon and watermelon juices. Populations of S. Enteritidis, E. coli and L. monocytogenes were experimentally reduced and validated in a single process up to 3.71 +/- 0.17, 3.7 +/- 0.3 and 3.56 +/- 0.26 log10 units, respectively, in melon juice when 1440 [mu]s and 217 Hz were used; whereas reductions up to 3.56 +/- 0.12, 3.6 +/- 0.4 and 3.41 +/- 0.13 log10 units of those microorganisms, respectively, were reached in watermelon juice treated for 1727 [mu]s at 188 Hz. Although PEF treatment reduced the populations of the three microorganisms, L. monocytogenes was more resistant to PEF than S. Enteritidis and E. coli in both juices when treated at the same processing conditions.
Keywords: PEF; Treatment time; Pulse frequency; Salmonella Enteritidis; E. coli; L. monocytogenes; Melon; Watermelon; Juice

L. Garcia-Gonzalez, A.H. Geeraerd, S. Spilimbergo, K. Elst, L. Van Ginneken, J. Debevere, J.F. Van Impe, F. Devlieghere, High pressure carbon dioxide inactivation of microorganisms in foods: The past, the present and the future, International Journal of Food Microbiology, Volume 117, Issue 1, 10 June 2007, Pages 1-28, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.02.018.
(http://www.sciencedirect.com/science/article/B6T7K-4N7SBH1-1/2/acefcaf3be72aa9e942bd74ea50dcb32)
Abstract:
Thermal pasteurization is a well known and old technique for reducing the microbial count of foods. Traditional thermal processing, however, can destroy heat-sensitive nutrients and food product qualities such as flavor, color and texture. For more than 2 decades now, the use of high-pressure carbon dioxide (HPCD) has been proposed as an alternative cold pasteurization technique for foods. This method presents some fundamental advantages related to the mild conditions employed, particularly because it allows processing at much lower temperature than the ones used in thermal pasteurization. In spite of intensified research efforts the last couple of years, the HPCD preservation technique has not yet been implemented on a large scale by the food industry until now. This review presents a survey of published knowledge concerning the HPCD technique for microbial inactivation, and addresses issues of the technology such as the mechanism of carbon dioxide bactericidal action, the potential for inactivating vegetative cells and bacterial spores, and the regulatory hurdles which need to be overcome. In addition, the review also reflects on the opportunities and especially the current drawbacks of the HPCD technique for the food industry.
Keywords: High-pressure carbon dioxide; Cold pasteurization; Microbial inactivation; Food quality; Inactivation mechanism

Vijay Nema, Ranu Agrawal, Dev Vrat Kamboj, Ajay Kumar Goel, Lokendra Singh, Isolation and characterization of heat resistant enterotoxigenic Staphylococcus aureus from a food poisoning outbreak in Indian subcontinent, International Journal of Food Microbiology, Volume 117, Issue 1, 10 June 2007, Pages 29-35, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.01.015.
(http://www.sciencedirect.com/science/article/B6T7K-4NCR8YT-3/2/d3364aab7d7e1910aaac710adb56c0da)
Abstract:

Outbreaks of staphylococcal food poisoning (SFP) are very common across the world, however, there is hardly any report of SFP from the Indian subcontinent. An outbreak occurred in the state of Madhya Pradesh (India) after the consumption of a snack called 'Bhalla' made up of potato balls fried in vegetable oil. More than 100 children and adults who ate the snack suffered from the typical symptoms of SFP and required hospitalization. Food and clinical samples were found to contain a large number of enterotoxigenic Staphylococcus aureus. All enterotoxigenic isolates produced a combination of SEB and SED enterotoxins and were sensitive to oxacillin and vancomycin. Isolates were characterized by molecular biology tools, viz., SDS-PAGE, amplified ribosomal DNA restriction analysis (ARDRA), randomly amplified polymorphic DNA (RAPD) and nucleotide sequencing of seb, sed, and 16S rDNA genes. Results of these studies suggested that the isolates, irrespective of their isolation from food or clinical samples, were clonal in origin. Further, seb gene sequence of isolates showed nucleotide variations at multiple sites when compared with other sequences available in the database. Representative isolates, one each from food and clinical samples, were found to be highly heat resistant (D60 ~ 15-16 min). Isolates obtained in the current outbreak need to be further studied to find out the impact on food safety guidelines with respect to thermal processing.
Keywords: Staphylococcal food poisoning; Outbreak; Staphylococcal enterotoxins; Heat resistance; ARDRA; RAPD; SEB; SED

Monica Haros, Maria Bielecka, Joanna Honke, Yolanda Sanz, Myo-inositol hexakisphosphate degradation by Bifidobacterium infantis ATCC 15697, International Journal of Food Microbiology, Volume 117, Issue 1, 10 June 2007, Pages 76-84, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.02.021.
(http://www.sciencedirect.com/science/article/B6T7K-4NCJCGX-1/2/809adf23d5bfc83909c4965dada198db)
Abstract:
The ability of five strains of different bifidobacterial species (Bifidobacterium animalis, B. bifidum, B. infantis, B. longum, B. pseudolongum) isolated from human and animal gut to degrade myo-inositol hexaphosphate or phytic acid (InsP6) has been evaluated. The disappearance of phytate and the generation of lower myo-inositol phosphates were determined in a complex medium in which phytic acid was the only source of phosphorus. Bifidobacterium infantis ATCC 15697 showed the highest level of phytate-degrading activity. This strain displayed optimal activity at slight acid pH (6.0-6.5) and 50 [degree sign]C, but also retained high activity levels at neutral pH and 37 [degree sign]C. B. infantis ATCC 15697 produced maximum activity during the stationary phase of growth and when 1% lactose was used as carbon source. In contrast, the presence of inorganic phosphate in the growth medium inhibited phytase activity. The ability of B. infantis ATCC 15697 to generate lower myo-inositol phosphates and, particularly, accumulate myo-inositol tri-phosphates (InsP3) from partial hydrolysis of InsP6 could contribute to the reduction of the anti-nutritional properties of InsP6 and the generation of intermediate compounds with beneficial properties during food processing and gastrointestinal transit.
Keywords: Bifidobacterium infantis; Phytate-degrading enzyme; Phytic acid; Inositol-phosphates

Mika L.M. MacInnis, Do rats time filled and empty intervals of equal duration differently?, Behavioural Processes, Volume 75, Issue 2, Proceedings of the Meeting of the Society for the Quantitative Analyses Behavior(SQAB 2006), Proceedings of the Meeting of the Society for the Quantitative Analyses Behavior(SQAB 2006), June 2007, Pages 182-187, ISSN 0376-6357, DOI: 10.1016/j.beproc.2007.02.006.
(http://www.sciencedirect.com/science/article/B6T2J-4N0X5P0-6/2/57316d318fc9a6a069b35f5fcae235e8)
Abstract:

The goal was to determine whether rats time filled and empty intervals of equal duration differently. Each of five rats was trained for 50 sessions on an instrumental appetitive head entry procedure in which food was available (primed) every 120 s. On 'empty' cycles, 30 s prior to the next food prime, a 0.5-s pulse of white noise was presented. On 'filled' cycles, 30 s prior to the next food prime, white noise came on and stayed on until food was delivered. The two types of cycles were presented with equal probability. The results showed that the rats timed both the food-to-food interval and the stimulus-to-food interval. A comparison of the response gradients on filled and empty cycles following stimulus presentation showed better temporal discrimination on filled cycles. The results were modeled using a Packet theory of timing, with a linear averaging rule to combine the temporal information provided by the stimulus and food. The model fits to the individual response gradients were evaluated with a Turing test.
Keywords: Timing; Filled intervals; Empty intervals; Simultaneous temporal processing; Packet theory; Turing test; Rats

Erika Silletti, Monique H. Vingerhoeds, Willem Norde, George A. van Aken, The role of electrostatics in saliva-induced emulsion flocculation, Food Hydrocolloids, Volume 21, Issue 4, June 2007, Pages 596-606, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.07.004.
(http://www.sciencedirect.com/science/article/B6VP9-4KV3Y31-2/2/e9a38a050bac2c316d10b9a02b6be820)
Abstract:
Upon consumption food emulsions undergo different processes, including mixing with saliva. It has been shown that whole saliva induces emulsion flocculation [van Aken, G. A., Vingerhoeds, M. H., & de Hoog, E. H. A. (2005). Colloidal behaviour of food emulsions under oral conditions. In E. Dickinson (Eds.), Food colloids 2004: Interactions, microstructure and processing (pp. 356-366). Cambridge: The Royal Society of Chemistry; Vingerhoeds, M. H., Blijdenstein, T. B. J., Zoet, F. D., & van Aken, G. A. (2005). Emulsion flocculation induced by saliva and mucin. Food Hydrocolloids, 19, 915-922]. It was hypothesized that depletion flocculation was responsible for the observed flocculation. To further unravel the mechanism, we investigated the role of electrostatics on the behavior of emulsion/saliva mixtures. Emulsions stabilized with differently charged surfactants and proteins were mixed with saliva. Strongly negatively charged emulsions (SDS and Panodan) do not flocculate, likely because the electrostatic repulsion between the droplets overcomes the attractive depletion and van der Waals interactions. Neutral and weakly negatively charged emulsions (Tween 20 and [beta]-lactoglobulin pH 6.7) undergo flocculation, which is reversible upon dilution with water. This is probably due to depletion interactions, induced by large salivary protein like mucins, in combination with the van der Waals interaction and the sufficiently low electrostatic repulsion between the droplets. Positively charged emulsions (CTAB, lysozyme and [beta]-lactoglobulin pH 3.0) show irreversible flocculation leading to rapid phase separation. These findings point to a role of electrostatic attraction between the negatively charged proteins present in saliva and the positively charged surfaces of the emulsion droplets. The results indicate that the sign and the density of the charge on the surface of the droplets contribute significantly to the behavior of an emulsion when mixed with saliva. Depending on the charge, saliva-induced emulsion flocculation is driven by two different main mechanisms: depletion flocculation and electrostatic attraction.
Keywords: Emulsion; Saliva; Flocculation; Depletion flocculation; Electrostatic interactions

Wim Verbeke, Iris Vermeir, Karen Brunso, Consumer evaluation of fish quality as basis for fish market segmentation, Food Quality and Preference, Volume 18, Issue 4, June 2007, Pages 651-661, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2006.09.005.
(http://www.sciencedirect.com/science/article/B6T6T-4MBC506-1/2/8986a46735aa04d00453fdbd2239ec0a)
Abstract:

This paper focuses on consumer evaluation of fish quality and its association with fish consumption, risk and benefit beliefs and information processing variables. Cross-sectional data were collected from a sample of 429 consumers in March 2003 in Belgium. Two dimensions shape fish quality evaluation: personal relevance attached to fish quality and self-confidence in fish quality evaluation, which allow segmenting the market in four fish consumer segments. The segments are typified as Uninvolved, Uncertain, Self-confident and Connoisseurs, and have distinctive behavioural, attitudinal and socio-demographic profiles. The Uninvolved are mainly young males, have the lowest fish consumption level, weakest belief in health benefits from eating fish, and lowest interest in both search and credence information cues. Uncertain fish consumers are mainly females, with a tendency of lower education and urban residence, who feel not confident to evaluate fish quality, although they find quality very important. They display a strong interest in a fish quality label. The most relevant findings about Self-confident consumers, whose socio-demographic profile matches best with the overall sample, are their high fish consumption level, and their relatively low interest in a fish quality label. Connoisseurs are mainly females in the age category 55+, who are strongly involved with food in general and most convinced of the association between food and health. They have the highest fish consumption and show a strong interest in both search and credence cues, as well as in a fish quality label. The segments do not differ with respect to risk perception about fish.
Keywords: Consumer; Fish; Information; Involvement; Perception; Quality; Segmentation

Begona Rubio, Beatriz Martinez, M Dolores Garcia-Cachan, Jordi Rovira, Isabel Jaime, The effects of high pressure treatment and of storage periods on the quality of vacuum-packed 'salchichon' made of raw material enriched in monounsaturated and polyunsaturated fatty acids, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 180-187, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.09.005.
(http://www.sciencedirect.com/science/article/B6W6D-4MFCW48-1/2/41637138127dbd3a32912e2c074107e0)
Abstract:
This study investigates the effects of high-pressure processing on the microbiological, physico-chemical and sensory properties of 3 fermented Spanish dry sausages (salchichon), all high in unsaturated fatty acids. The products, manufactured from the sausage meat and back fat of pigs fed on high-oleic and high-linoleic diets and a control diet, were vacuum-packed prior to high hydrostatic pressure (HPP) treatment (500 MPa, 5 min), and storage at 6 [degree sign]C for up to 210 days. High-pressure treatment slightly inhibited certain microorganisms, especially yeasts and moulds, and psychotrophic and anaerobic bacteria. Consequentially, microbial counts fell, although injured microorganisms recovered during storage except in the case of the high-linoleic salchichon, in which they remained inactive causing it to register the lowest counts. High-pressure treatment had no noticeable effect on the physico-chemical and sensory properties of the three samples suggesting that it improves the food safety of salchichon with no detrimental effects on organoleptic properties.Industrial relevance
The problem of safe preservation is increasingly complex for the meat industry as today's products require longer shelf lives and greater assurance of protection from microbial spoilage. High pressure processing is finding increased use in products such as sliced cured meats, where microbial contamination can occur during the slicing process and develop over storage. This study evaluates the microbiological, physicochemical and sensory characteristics of vacuum-packed slices of dry fermented sausage - control (CO), high oleic (HO), and high linoleic (HL) salchichon samples - following high pressure treatment and subsequent chilled storage, contributing thereby to the growing body of knowledge on this new food preservation technology, which produces microbiologically safe food products with long shelf lives, whilst retaining high nutritional and sensory qualities.

Keywords: Vacuum packaging; High-pressure processing; Fermented sausage; Salchichon; Meat products

G. Prestamo, J. Fontecha, High pressure treatment on the tofu fatty acids and acylglycerols content, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 188-191, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.10.002.
(http://www.sciencedirect.com/science/article/B6W6D-4MRNCV3-1/2/d538338a82c309ed2ae41da8dd8349a0)
Abstract:
Three batches of tofu were purchased from the local market. The samples were packaged under vacuum, and half of them subjected to a pressure in a range of 100 to 350 MPa at ambient temperature (22 [degree sign]C) for 15 min, the rest were considered as control. The soy fat was extracted with hexane and the characterisation of fatty acids composition as methyl esters (FAME) and their diacyl-triacylglycerols (DAG, TAG) were analysed by Gas chromatography (GC). The tofu fat is low in saturated fatty acids (SFA, ~ 16%) and high in polyunsaturated fatty acids (PUFA, ~ 64%). The DAG content was lower than 10% and the highest value obtained for TAG was for the CN54 (~ 60%), followed for the CN52 (~ 28%) and CN50 (~ 4%). No significant changes on the profile fat pattern have been found after the high pressure treatment in the assayed conditions. The ratios of PUFA/SFA and n-6/n-3 are 4 and 7 respectively. Tofu can be subjected to HP of 350 MPa without significant changes in its fat pattern.Industrial relevance
Tofu is becoming an increasingly important international product outside its traditional markets. The use of high pressure processing for preservation purposes is a potential to retain or increase the nutritional value of foods of high relevance. This paper concentrates on the impact of high pressure on polyunsaturated acid and di-triacylglycerols. Interestingly no significant changes due to high pressure treatment could be observed marking this an attractive processing option.
Keywords: High pressure; Tofu; Acylglycerols; Fatty acids

N. Oulahal, A. Martial-Gros, M. Bonneau, L.J. Blum, Removal of meat biofilms from surfaces by ultrasounds combined with enzymes and/or a chelating agent, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 192-196, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.10.001.
(http://www.sciencedirect.com/science/article/B6W6D-4MMFVSN-1/2/c9c34ebb48c54a0bb8c7e10545494b48)
Abstract:
A curved ultrasonic transducer was devised to standardise biofilm removal for hygiene testing in internal or curved food contact surfaces. Meat biofilms made with Escherichia coli and Staphylococcus aureus on stainless steel sheets were studied. Ultrasounds (10 s at 40 kHz) alone failed to completely remove biofilms: 49 +/- 5% and 39 +/- 5% recovery rates were obtained for E. coli and S. aureus biofilms, respectively. A combined treatment, which involved the application of ultrasounds to EDTA and/or in enzymes solutions, allowed to remove up to 75 +/- 4% and 100 +/- 15% of E. coli and S. aureus biofilms, respectively. This application was in agreement with an industrial control i.e. a combined treatment: ultrasound generation in enzymes preparation restricted to an active chamber area with a fast and good reproducible recovery.Industrial relevance
The biofilm phenomenon has been under intensive research for several years in food industry. A curved ultrasonic transducer was devised to standardise biofilm removal for hygiene testing in internal or curved food contact surfaces. This apparatus uses the mechanical effects of ultrasonic cavitation produced at 40 KHz (10 s) for the non-destructive detection of biofilms in food processing equipment. We report the utilisation of a combined treatment, which involved the application of ultrasounds to EDTA and/or in enzymes solutions on meat biofilms made with E. coli and S. aureus on stainless steel sheets. This application was in agreement with an industrial

control i.e. a combined treatment: ultrasound generation in EDTA and/or enzymes preparation restricted to an active chamber area with a fast and good reproducible recovery.
Keywords: Biofilms removal; Ultrasounds; Enzymes; Chelating agent; Stainless steel surfaces; Meat

Sally R. Alkhafaji, Mohammed Farid, An investigation on pulsed electric fields technology using new treatment chamber design, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 205-212, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.11.001.
(http://www.sciencedirect.com/science/article/B6W6D-4MRFCBP-1/2/86f4da770cffd39ce2e8d0d15696be0c)
Abstract:
A pulsed electric field (PEF) system was designed and constructed using modern IGBT technology. The main focus of this work was to design a new PEF treatment chamber that operate at high electric field intensities with limited increase in liquid temperature and limited fouling of electrodes. Four multi-pass treatment chambers were designed consisting of two stainless steel mesh electrodes in each chamber, with the treated fluid flowing through the openings of the mesh electrodes. The two electrodes are electrically isolated from each other by an insulator element designed to form a small orifice where most of the electric field is concentrated. Dielectric breakdown inside the chambers was prevented by removing the electrodes far from the narrow gap. The effect of PEF treatment on the inactivation of gram-negative Escherichia coli ATCC 25922 suspended in simulated milk ultra-filtrate (SMUF) of 100%, 66.67% and 50% w/w was investigated. Treatments with the same electrical input power but with higher electric field strengths provided larger degree of killing. The effect of PEF treatment using suspensions at different flow rates and different pulse frequencies was also investigated. In general, the inactivation rate of E. coli increased with increasing electric field strength, treatment time and processing temperature. More than 6 log reductions in E. coli suspended in SMUF was achieved using electric field intensity in the range of (37.2-49.6 kV/cm) with a treatment temperature not exceeding 38 [degree sign]C.Industrial relevance
This paper presents an innovative pulsed electric field system for non-thermal pasteurisation of liquid food. The system design provides uniform distribution of electric field and minimum fouling of electrodes. This PEF system can be scaled up to any industrial size, making it attractive for industrial applications.
Keywords: Non-thermal pasteurisation; Pulsed electric fields; Microbial inactivation; E. coli ATCC 25922

Yan Jiang, Chuan-He Tang, Qi-Biao Wen, Lin Li, Xiao-Quan Yang, Effect of processing parameters on the properties of transglutaminase-treated soy protein isolate films, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 218-225, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.11.002.
(http://www.sciencedirect.com/science/article/B6W6D-4MM2634-1/2/e57c22a3c2a2a596455b452c59c4f2ce)
Abstract:
The effects of processing parameters, including the applied amount of microbial transglutaminase (MTGase), the pH of film-forming solution, air-drying temperature, as well as the additional pre-incubation, on the properties of MTGase-treated soy protein isolate (SPI) films were investigated. The treatment with low concentration of MTGase (4-10 units per gram of SPI, U g- 1) significantly increased the tensile strength (TS) values of SPI films, while high concentration of MTGase (over 20 U g- 1) resulted in significant decrease in the TS values ($P <= 0.05$). The elongation at break (EB) values of corresponding films gradually decreased, and the contact angle values persistently increased with the enzyme concentration. At alkaline pH range, the TS and EB values of MTGase-treated SPI films were significantly higher than that at pH 7.0 ($P <= 0.05$). Meanwhile, the contact

angle values significantly decreased with increasing pH from 7.0 to 10.0 (P <= 0.05). The TS, EB and contact angle values of MTGase-treated films gradually but insignificantly decreased with increasing the air-drying temperature from 18 to 50 [degree sign]C (P > 0.05). The properties of MTGase-treated films were also affected by the additional pre-incubation of film-forming solutions with MTGase before casting. Furthermore, the aggregation of SPI or its components induced by MTGase has been proved to mainly account for the influence of processing parameters on the properties of SPI films (MTGase-treated). Thus, low concentration of enzyme, alkaline pH range and low air-drying temperature, at which conditions the MTGase-induced aggregation of SPI in film-forming solutions could be in some extent inhibited or delayed, might facilitate the improvement of the properties of SPI films by MTGase, especially the mechanical and surface hydrophobic properties.Industrial relevance
The development of biodegradable protein film has attracted a lot of attention worldwide. The enzymatic cross-linking induced by transglutaminase has been confirmed to improve mechanical and surface hydrophobic properties of cast films from most of food proteins, including soy proteins. Results of this study show that, the improvement of properties of cast films of soy proteins by transglutaminase treatment is largely dependent upon many processing parameters, e.g., enzyme concentration, the pH of film-forming solution and temperature.
Keywords: Transglutaminase (TGase); Soy protein isolate (SPI); Protein films; Mechanical property; Cross-linking

F.P. Campos, M. Cristianini, Inactivation of Saccharomyces cerevisiae and Lactobacillus plantarum in orange juice using ultra high-pressure homogenisation, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 226-229, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.12.002.
(http://www.sciencedirect.com/science/article/B6W6D-4MSHY1N-1/2/95f8332ea7d19663f58770a85a5658f6)
Abstract:
Yeasts and lactic acid bacteria are the usual contaminants in orange juice and responsible for decreasing the shelf life of the product. Ultra high-pressure homogenisation has been shown to be an alternative to the traditional thermal pasteurisation of pumpable foods. The product was pumped through a homogeniser valve at 100 MPa, 150 MPa, 200 MPa, 250 MPa and 300 MPa using two synchronized overlapped intensifiers at a flow rate of approximately 270 mL/min. The inlet temperature was kept at 10 [degree sign]C, pH at 4.1 and soluble solids at 10.0 [degree sign]Bx. After processing, the product was immediately cooled to 4 [degree sign]C and the microbiological count was determined. The study showed that Lactobacillus plantarum and Saccharomyces cerevisiae are sensible to ultra high-pressure homogenisation treatment. The results indicated that pressures higher than 250 MPa were able to completely destroy initial loads of 1.2 x 107 UFC/mL of L. plantarum and 2.9 x 105 UFC/mL of S. cerevisiae in orange juice, making this technology a promising way to nonthermally process orange juices.Industrial relevance
This paper deals with inactivation of microorganism contaminants of orange juice using dynamic ultra high process technology. It is of industrial interest and relevance to evaluate the use of this non-thermal emerging technology to process fluid foods that may result into better taste, optimum product functionality, safety and quality characteristics.
Keywords: High pressure; Homogenisation; Orange juice; Microbial inactivation; Saccharomyces; Lactobacillus

Soojin Jun, Sudhir Sastry, Chaminda Samaranayake, Migration of electrode components during ohmic heating of foods in retort pouches, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 237-243, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.01.001.

(http://www.sciencedirect.com/science/article/B6W6D-4MSPV4R-1/2/a9ac3ed34ceff65de1a680b3c4b2617c)
Abstract:
During space missions, life support technologies must satisfy mission constraints, including maximizing safety and acceptability of food and minimizing crew time, storage volume, power, water usage, and maintenance down-time. Ohmic heating appears to be a feasible potential solution to meet food reheating and waste sterilization requirements; however, it is necessary to verify if electrochemical reactions such as gas generation and electrode corrosion occur. A pulsed ohmic heating system and reusable pouch were tested to ensure the food safety and quality by minimizing the undesired electrochemical reactions. Results of gas generation during ohmic heating show that stainless steel is far superior to aluminum since there were no noticeable gas bubbles even at the temperature of 70 [degree sign]C. A study of migration of the major key metal ions from stainless steel, such as Fe, Cr, Ni, Mn, and Mo, measured by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) shows that pulsed ohmic heating produced comparable or lower migration of most targeted metal ions, compared to the conventional retorting when electrodes were present. The intakes of individual metal contaminants evaluated with respect to a typical meal (8 oz) after ohmic treatment were, as a maximum, 13.5% of recently published upper-level daily dietary exposure estimates. Consequently, pouches with stainless steel electrodes powered by a pulsed ohmic heater shows promise as a potential reheating and sterilization technology for space missions.Industrial relevance
Ohmic heating has been used for many years in different industries and proved to be a promising food processing technology due to its rapid, yet uniform and high energy efficient heating capability. This paper demonstrates the potential of direct ohmic heating for foods in retort pouches at the household level as well as the mass production level, ensuring food safety by suppressing the metal ions migration far less than the dietary exposure estimates.
Keywords: Stainless steel; Electrolysis; Ohmic heating; Corrosion; Metal ions

Adrienne E.H. Shearer, Gary C. Wilkins, Mark C. Jenkins, Kalmia E. Kniel, Effects of high hydrostatic pressure on Eimeria acervulina pathogenicity, immunogenicity and structural integrity, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 259-268, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.01.004.
(http://www.sciencedirect.com/science/article/B6W6D-4MWGFGH-1/2/625ab0f0059df566a078a0d6888e2d65)
Abstract:
Eimeria acervulina is a protozoan parasite that can cause intestinal lesions and reduced weight gain in chickens. E. acervulina oocysts were treated by high hydrostatic pressure and evaluated for pathogenicity, immunogenicity, and structural integrity. Pressure treatment of E. acervulina oocysts at 550 MPa for 2 min at 4, 20 or 40 [degree sign]C rendered the parasites nonpathogenic to chickens. Pressure treatment at 40 [degree sign]C also prevented fecal shedding of oocysts. Upon challenge with non-pressurized E. acervulina oocysts, partial immunity was observed with a reduction in lesion severity in chickens that had been inoculated with pressure-treated oocysts. No changes to the fragility and permeability of the oocyst wall or excystation of sporocysts were observed as a result of pressure treatment. Light and scanning electron microscopy revealed no changes to the whole oocyst or sporocysts. Recovery and the morphology of excysted sporozoites were altered by pressure treatment. These results suggest that pressure affects sporozoite integrity.Industrial relevance
High-hydrostatic pressure processing has been shown to inactivate various microorganisms and is utilized commercially for enhanced food safety and quality. Some pathogenic microorganisms have been inactivated by HPP yet retain immunogenic properties suggesting potential application for vaccine development. Eimeria acervulina is a poultry pathogen for which new vaccines are sought. E. acervulina is also closely related to Cyclospora cayetanensis, a foodborne human

pathogen. HPP was explored for effect on E. acervulina for potential vaccine development for chickens and for insight on HPP effects on parasites for enhanced safety of human foods.
Keywords: High pressure processing; Inactivation; Microscopy; Cyclospora surrogate; Sporozoite; Eimeria; Immunogenicity; Vaccine

Hadiyanto, A. Asselman, G. van Straten, R.M. Boom, D.C. Esveld, A.J.B. van Boxtel, Quality prediction of bakery products in the initial phase of process design, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 285-298, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.01.006.
(http://www.sciencedirect.com/science/article/B6W6D-4N0HJGB-2/2/f24746137293ed9dbdcd1006e5504258)
Abstract:
The development of food production processes is facilitated by tools which explore the interaction between process design, operation conditions and product characteristics. In this work an approach how to set-up a simulation model is presented for the phenomena and transformations which occur during baking and which fix the product quality. The simulation model has three consecutive parts: mass and heat transport in the product, transformations concerning starch state transition and color, and the formation of quality attributes (color, softness, crispness and staling). The model for mass and heat transfer is based on laws of conservation and expressed in partial differential equations for spatial products. The starch state transition and color formation are a mixture of qualitative and quantitative information, while the product quality model is mainly based on qualitative information. The model is applied to three bakery products: bread, biscuit and a cake-type. The results show that the model estimates the product quality and its transformations as a function of dough composition, baking and storage condition. The results fit well to observed changes of properties and product quality during baking.Industrial relevance
Food industries require tools to evaluate processing options in the feasibility phase of process design. Therefore, simulation of process models is important for this purpose. However, knowledge of different aspects is subject to area of expertise (for example heat and mass transfer versus product quality formation) and often these areas are hardly connected. This work presents a systematic modeling approach for the dominant processes during baking and their interconnection. The main functions of the model are to explore the consequences of choices in design, to rank design options and to find in what direction properties will change when operational conditions change. Moreover, the model can be used for sensitivity analysis to explore on what items further information must be gathered.
Keywords: Baking; Heat mass transfer; Product quality prediction

Mafalda Quintas, Carla Guimaraes, Joao Baylina, Teresa R.S. Brandao, Cristina L.M. Silva, Multiresponse modelling of the caramelisation reaction, Innovative Food Science & Emerging Technologies, Volume 8, Issue 2, June 2007, Pages 306-315, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.02.002.
(http://www.sciencedirect.com/science/article/B6W6D-4N5TN8H-1/2/9a61451fd992b4264de50918c3478403)
Abstract:
Multiresponse modelling is a powerful tool for studying complex kinetics of reactions occurring in food products. This modelling technique uses information of reactants and products involved, allowing insightful kinetic parameters estimation and helping in clarifying reaction mechanisms. One example of a complex reaction that occurs in food processing is the caramelisation reaction. Caramelisation is the common name for a group of reactions observed when carbohydrates are exposed to high temperatures.
The objective of this work was to apply multiresponse regression in developing a mathematical mechanistic model that describes sucrose thermal degradation and caramelisation products

formation in highly concentrated sucrose solutions, with different water contents and under various temperatures.
Results demonstrated the usefulness of multiresponse modelling in understanding reaction mechanisms in food matrices. A mechanistic model for the caramelisation reaction was proposed, which successfully described the experimental data of concentrated solutions in the 30.03 to 12.20% (w/w) water content range. Furthermore, good predictions of temperature and water content effects were achieved. For extremely low water content systems (3.58% (w/w)), the proposed mechanistic model failed to describe experimental data, indicating different reaction pathways.Industrial relevance
Caramelisation is one reaction occurring during heat treatment in high sugar content food products. Understanding the mechanism of caramelisation reaction and the effect of the environmental conditions on different reaction steps may help in the design of products and processes, in order to prevent or promote such occurrence. This work also uses an advanced modelling technique that can be used in any food system for any reaction occurring during processing.
Keywords: Multiresponse modelling; Sucrose thermal degradation; Caramelisation reaction; Kinetic parameters

Kostadin Fikiin, Handbook of frozen food processing and packaging, International Journal of Refrigeration, Volume 30, Issue 4, June 2007, Pages 745-746, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2006.08.002.
(http://www.sciencedirect.com/science/article/B6V4R-4MRFCB4-1/2/fa84331b9753a0eb4fc1a801ea3f0775)

A.G. Abdul Ghani, M.M. Farid, Numerical simulation of solid-liquid food mixture in a high pressure processing unit using computational fluid dynamics, Journal of Food Engineering, Volume 80, Issue 4, June 2007, Pages 1031-1042, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.08.018.
(http://www.sciencedirect.com/science/article/B6T8J-4M644XY-1/2/caee14535dd1fcf4fd80cff8f988ef88)
Abstract:
Temperature distribution, velocity and pressure profiles during high pressure compression (500 MPa) of liquid food (water) and solid-liquid food mixture (beef fat and water), within a three dimensional cylinder basket is simulated. The computations domain in both cases was performed for a cylinder with a diameter of 38 mm and height of 290 mm, which are the same dimensions of the high pressure unit 'FOOD-LAB model S-FL-850-9-W' available at the University of Auckland, New Zealand. The governing equations for continuity, momentum and energy conservation are solved using a commercial computational fluid dynamics (CFD) package (PHOENICS), version 3.5, which is based on a finite volume method of solution. The simulation for liquid food only shows the effect of forced and free convection flow on the temperature distribution in the liquid at the early stages of compression. This is due to the difference between the velocity of the pumping fluid as it enters the cylinder inlet hole (10-2-10-3) m s-1 and the velocity in the treatment chamber (10-8-10-9) m s-1. The simulation for the solid-liquid mixture shows as well, the temperature distribution in the solid and liquid at different stages of compression. It shows that the solid pieces are more heated than the liquid, which is due to the difference in their compression heating coefficient. Validation of the computed temperature in both cases is found to be in an agreement with those measured experimentally and reported in the literature.
Keywords: High pressure processing; CFD; Temperature distribution; Velocity profile; Adiabatic heating

Soojin Jun, Sudhir Sastry, Reusable pouch development for long term space missions: A 3D ohmic model for verification of sterilization efficacy, Journal of Food Engineering, Volume 80, Issue 4, June 2007, Pages 1199-1205, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.09.018.
(http://www.sciencedirect.com/science/article/B6T8J-4MG1NNB-1/2/a8f194af84aa6d77118734a0142c8532)
Abstract:
One of the challenges of food system development during a long term space mission is the need for reheating of food, processing and stabilization of waste products, including food and biological waste. We have previously reported on the development of a pouch with electrodes, which permits reheating and sterilization of its internal contents, and the development of a two-dimensional heat transfer model for design optimization. However, a fully three-dimensional model is necessary for ensuring that thermal processes result in sterility of all parts of the product, particularly edge regions. The ohmic heating of tomato soup in a pouch was simulated using computational fluid dynamics (CFD) codes with user defined functions (UDFs) for electric field equations. In general, good agreement was observed between model and experiment, excepting a zone at the edge, where the model tended to underpredict temperature. The 3D model permitted identification of the potential cold spots over the entire pouch, which was not obvious using our previous 2D model. In particular, the bottom corners of the pouch were found to be a zone of low current density, and showed a temperature of only 53.3 [degree sign]C even when the peak pouch temperature was 139 [degree sign]C. The 3D model is a useful tool to optimize electrode configurations, and to assure adequate sterilization processes.
Keywords: Ohmic heating; Heat transfer model; Computational fluid dynamics; Batch sterilization; Pouch

Tone Mari Rode, Solveig Langsrud, Askild Holck, Trond Moretro, Different patterns of biofilm formation in Staphylococcus aureus under food-related stress conditions, International Journal of Food Microbiology, Volume 116, Issue 3, 30 May 2007, Pages 372-383, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.02.017.
(http://www.sciencedirect.com/science/article/B6T7K-4N6FFGH-4/2/060c9527dbf6d452ab6eb2c9dcd371de)
Abstract:
Staphylococcus aureus and its biofilm formation are recognized as a serious clinical problem. S. aureus is also a food borne pathogen, and little is known regarding biofilm formation of food-related strains. We have studied biofilm formation of both food-related and clinical S. aureus strains grown under different stress conditions (temperature, sodium chloride, glucose and ethanol) relevant for food processing. Strong biofilm formers were identified among food-related S. aureus strains, and biofilm formation was affected by environmental conditions relevant for the food industry. The results showed that temperatures suboptimal for growth increased the production of biofilm. The combined presence of sodium chloride and glucose enhanced the biofilm formation. Both temperature and osmolarity affected the expression of several biofilm associated genes (e.g. icaA and rbf). Variations in gene expression (e.g. icaA, agrA and sigB) between strains were also observed. Our results support the existence of both ica-dependent and ica-independent mechanisms of biofilm production in S. aureus. The phenotypic and genotypic results showed highly diverse and complex patterns of biofilm formation in S. aureus. This clearly demonstrates that caution must be exercised before drawing general conclusions about gene expression in S. aureus in relation to regulation of biofilm formation. The results are relevant for food safety as they indicate that food processing conditions could promote biofilm formation by S. aureus.
Keywords: Staphylococcus aureus; Biofilm; Stress; Glucose; NaCl; Temperature; icaA; rbf

Stefano Perni, Timothy G. Aldsworth, Suzanne J. Jordan, Isabel Fernandes, Manuela Barbosa, Manuela Sol, Rogerio P. Tenreiro, Lelia Chambel, Isabel Zilhao, Belarmino Barata, Andrea Adriao, M. Leonor Faleiro, Peter W. Andrew, Gilbert Shama, The resistance to detachment of dairy strains of Listeria monocytogenes from stainless steel by shear stress is related to the fluid dynamic characteristics of the location of isolation, International Journal of Food Microbiology, Volume 116, Issue 3, 30 May 2007, Pages 384-390, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.03.002.
(http://www.sciencedirect.com/science/article/B6T7K-4N8BMST-1/2/8a9c21868e16de9d7b9b3ae1794543b6)
Abstract:
Strains of Listeria monocytogenes isolated from artisanal Portuguese cheese-making dairies were divided into two categories on the basis of the locations from which they were isolated: strains from dynamic locations were those that were habitually exposed to flowing liquids during the process of cheese-making, whereas those from static locations were rarely, if ever, exposed to the shear stresses generated by liquid flows. The strength of attachment to stainless steel discs of all of these strains was obtained using a radial flow chamber. Initial attachment strengths to stainless steel (after a 0.5 h contact time) of L. monocytogenes strains were greater for the 5 isolates from surfaces exposed to flow (dynamic isolates) than for most (3 out of 4) of those that were not (static isolates). After a 24 h contact time, attachment strength of all isolates reached similar levels. These results suggest that strains having high initial attachment strength are more likely to persist on surfaces exposed to flow than strains having low initial attachment strength. The numerical values of shear forces obtained could prove useful in the rational design of cleaning and decontamination procedures in food processing facilities.
Keywords: Listeria monocytogenes; Radial flow chamber; Shear stress; Detachment forces

Randall S. Singer, Louis A. Cox Jr., James S. Dickson, H. Scott Hurd, Ian Phillips, Gay Y. Miller, Modeling the relationship between food animal health and human foodborne illness, Preventive Veterinary Medicine, Volume 79, Issues 2-4, 16 May 2007, Pages 186-203, ISSN 0167-5877, DOI: 10.1016/j.prevetmed.2006.12.003.
(http://www.sciencedirect.com/science/article/B6TBK-4MY0TKS-1/2/82645c3d07b0d88922d95d14872ed5ba)
Abstract:
To achieve further reductions in foodborne illness levels in humans, effective pre-harvest interventions are needed. The health status of food animals that are destined to enter the human food supply chain may be an important, although often overlooked, factor in predicting the risk of human foodborne infections. The health status of food animals can potentially influence foodborne pathogen levels in three ways. First, diseased animals may shed higher levels of foodborne pathogens. Second, animals that require further handling in the processing plant to remove affected parts may lead to increased microbial contamination and cross-contamination. Finally, certain animal illnesses may lead to a higher probability of mistakes in the processing plant, such as gastrointestinal ruptures, which would lead to increased microbial contamination and cross-contamination. Consequently, interventions that reduce the incidence of food animal illnesses might also help reduce bacterial contamination on meat, thereby reducing human illness. Some of these interventions, however, might also present a risk to human health. For example, the use of antibiotics in food animals can reduce rates of animal illness but can also select for antibiotic-resistant bacteria which can threaten human treatment options. In this study, we present a mathematical model to evaluate human health risks from foodborne pathogens associated with changes in animal illness. The model is designed so that potential human health risks and benefits from interventions such as the continued use of antibiotics in animal agriculture can be evaluated simultaneously. We applied the model to a hypothetical example of Campylobacter from chicken. In general, the model suggests that very minor perturbations in microbial loads on meat products

could have relatively large impacts on human health, and consequently, small improvements in food animal health might result in significant reductions in human illness.
Keywords: Risk-benefit analysis; Dynamic simulation model; Food safety; Campylobacter; Macrolide

T.N. Nortey, J.F. Patience, J.S. Sands, R.T. Zijlstra, Xylanase supplementation improves energy digestibility of wheat by-products in grower pigs, Livestock Science, Volume 109, Issues 1-3, 10th International Symposium on Digestive Physiology in Pigs, Denmark 2006, Part 2, 15 May 2007, Pages 96-99, ISSN 1871-1413, DOI: 10.1016/j.livsci.2007.01.092.
(http://www.sciencedirect.com/science/article/B7XNX-4MY11CS-J/2/f9699affdc35914b697f23033054d9e9)
Abstract:
Value-added processing of cereals produces high-value fractions for food and bio-processing application and by-products that are used in animal nutrition to reduce feed costs. Wheat by-products contain arabinoxylans that might limit nutrient digestibility. Effects of xylanase supplementation (0 or 4375 U/kg feed) on energy digestibility were studied in a wheat control and by-product diets (30% millrun, middlings, shorts, screenings, and bran) in a 2 x 6 factorial arrangement. The wheat control diet was formulated to contain 3.34 Mcal digestible energy (DE)/kg and 2.8 g apparent digestible lysine/Mcal DE, and included 0.4% chromic oxide as a marker for digestibility. Twelve ileal-cannulated pigs (32.5 +/- 2.5 kg) were each fed seven of 12 diets. Faeces and then digesta were each collected for 2 d, and diet digestibility values are reported. Wheat had higher ileal and total-tract energy digestibility than by-products ($P < 0.01$). Xylanase improved energy digestibilities for by-products ($P < 0.001$) but not for wheat. Among by-products, ileal energy digestibility was lowest for middlings (62%), then bran < screenings < millrun, and highest for shorts (66%). Xylanase improved ($P < 0.05$) ileal energy digestibility of millrun by 19% to 76%. Total-tract energy digestibility of millrun improved from 72 to 79% (similar to wheat) with xylanase ($P < 0.05$). In summary, xylanase improved energy digestibility in the selected wheat by-product diets, indicating that arabinoxylans in wheat by-products limit nutrient digestibility.
Keywords: Energy digestibility; Pig; Wheat by-product; Xylanase

Yuqiao Gu, Hans Liljenstrom, Modelling efficiency in insect olfactory information processing, Biosystems, Volume 89, Issues 1-3, Selected Papers presented at the 6th International Workshop on Neural Coding, 6th International Workshop on Neural Coding, May-June 2007, Pages 236-243, ISSN 0303-2647, DOI: 10.1016/j.biosystems.2006.04.021.
(http://www.sciencedirect.com/science/article/B6T2K-4MBT1FH-7/2/d66dee0e69aca0e84aca84b326244b5f)
Abstract:
The olfactory system of insects is essential for the search of food and mates, and weak signals can be detected, amplified and discriminated in a fluctuating environment. The olfactory system also allows for learning and recall of odour memories. Based on anatomical, physiological, and behavioural data from the olfactory system of insects, we have developed a cross-scale dynamical neural network model to simulate the presentation, amplification and discrimination of host plant odours and sex pheromones. In particular, we model how the spatial and temporal patterns of the odour information emerging in the glomeruli of the antennal lobe (AL) rely on the glomerular morphology, the connectivity and the complex dynamics of the AL circuits. We study how weak signals can be amplified, how different odours can be discriminated, based on stochastic (resonance) dynamics and the connectivity of the network. We further investigate the spatial and temporal coding of sex pheromone components and plant volatile compounds, in relation to the glomerular structure, arborizing patterns of the projection neurons (PNs) and timing patterns of the neuronal spiking activity.

Keywords: Olfaction; Antennal lobe; Oscillations; Noise; Amplification; Discrimination; Spatio-temporal coding

L. Jayakody, R. Hoover, Q. Liu, E. Donner, Studies on tuber starches. II. Molecular structure, composition and physicochemical properties of yam (Dioscorea sp.) starches grown in Sri Lanka, Carbohydrate Polymers, Volume 69, Issue 1, 1 May 2007, Pages 148-163, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2006.09.024.
(http://www.sciencedirect.com/science/article/B6TFD-4MD468R-1/2/1337c17d8d12ac3adf53de7b93b201bd)
Abstract:
Starch from varieties of Dioscorea esculenta (Lour.) Burkill (kukulala, java-ala, nattala) and Dioscorea alata L. (hingurala, raja-ala) tubers grown in Sri Lanka was isolated and its morphology, composition, structure and physicochemical properties were studied. The yield of starch was in the range 12.2-18.0% on a whole tuber basis. The shape and size of D. esculenta and D. alata starch granules were round to polygonal (3-10 [mu]m) and spade shaped (30-45 [mu]m), respectively. There was considerable variation in total amylose, phosphorous, bound lipid, amylose leaching, swelling factor, gelatinization parameters, extent of retrogradation, pasting characteristics, susceptibility towards enzyme and acid hydrolysis crystallinity and lipid complexed amylose chains between and among the starches belonging to the two species. The chain length distribution of debranched amylopectins of the starches showed that the proportion of short branched chains (dp 6-12), medium chains (dp 25-36) and average chain length of amylopectin were significantly ($P < 0.05$) higher in the D. esculenta starches. However, variations in amylopectin structure among varieties of both species were not significant ($P < 0.05$). D. esculenta starches exhibited a `B'-type powder X-ray diffraction pattern. However, in the D. alata starches, hingurala and raja-ala displayed `C'- and `B'-type patterns, respectively. The results showed that some of the starches from the above species could be used in foods subjected to thermal processing and frozen storage, respectively, with minimal physical or chemical modification.
Keywords: Dioscorea starches; Molecular structure; Composition; Properties

R. Simpson, I. Figueroa, A. Teixeira, Simple, practical, and efficient on-line correction of process deviations in batch retort through simulation, Food Control, Volume 18, Issue 5, May 2007, Pages 458-465, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.12.003.
(http://www.sciencedirect.com/science/article/B6T6S-4J8D8YF-1/2/6a17eaf47d3006bdfab4cfae10f031e8)
Abstract:
This paper describes a simple, practical and efficient (nearly precise, yet safe) strategy for on-line correction of thermal process deviations during retort sterilization of canned foods. The strategy is intended for easy implementation in any cannery around the world. Commercial systems currently in use for on-line correction of process deviations do so by extending process time to that which would be needed had the entire process been carried out at the lower retort temperature reached at the lowest point in the deviation ('commercial' correction). This method of correction often results in extensive unnecessary over-processing with concomitant deterioration in product quality, and costly interruption to the retort loading/unloading rotation schedules in retort cook room operations. These problems are addressed by a novel control strategy that takes into account the duration of the deviation in addition to the magnitude of the temperature drop. It calculates a 'proportional' extended process time at the recovered retort temperature that will deliver the final specified target lethality with very little over processing in comparison to current industry practice. Results from an exhaustive 'optimization' search routine using the complex method are also reported, that show the proposed strategy will always result in a corrected process that delivers no less than the final target lethality specified for the originally scheduled process.
Keywords: On-line control; Low acid foods; Batch retort; Process deviations

Axel Benichou, Abraham Aserin, Rachel Lutz, Nissim Garti, Formation and characterization of amphiphilic conjugates of whey protein isolate (WPI)/xanthan to improve surface activity, Food Hydrocolloids, Volume 21, Issue 3, May 2007, Pages 379-391, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.04.013.
(http://www.sciencedirect.com/science/article/B6VP9-4K0MF72-1/2/5dc25923de1e6bf9ed2fc1ce3bcf0c91)
Abstract:
Proteins, polysaccharides and their blends, as examples of natural biopolymers, may be considered as amphiphilic macromolecules that play an essential role in stabilizing food formulations (foams, emulsions and dispersions). Under specific compositions and conditions (protein-to-polysaccharide ratio, pH, ionic strength, temperature, mixing, processing steps) proteins and polysaccharides form water-soluble hybrids (complexes or conjugates), but not coacervates, with enhanced functional properties in comparison to the proteins and polysaccharides alone.
Aqueous mixtures of WPI (4-10 wt%) and xanthan gum (>0.5 wt%) form clear aqueous systems exhibiting new physicochemical properties such as rheological behavior, surface properties, surface density of charge (zeta potential), surface hydrophobicity and diffusion behavior.
Electrostatic interactions and thermodynamic incompatibility in mixed biopolymer solutions were correlated to the functional properties (rheology, surface properties and surface hydrophobicity) of these adducts.
Evidences for associative interactions between WPI and xanthan gum have been established by studying the rheological behavior, the surface hydrophobicity and the surface dynamic properties of the blends. The electrostatic and hydrophobic interactions form hybrids that can provide a synergistic effect on the emulsifying capabilities of the biopolymers and can increase the stability of emulsion droplets against coalescence and flocculation.
Keywords: Whey protein isolate (WPI)/polysaccharide hybrids; Xanthan gum; Biopolymeric amphiphile

J.F. Prinz, A.M. Janssen, R.A. de Wijk, In vitro simulation of the oral processing of semi-solid foods, Food Hydrocolloids, Volume 21, Issue 3, May 2007, Pages 397-401, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2006.04.009.
(http://www.sciencedirect.com/science/article/B6VP9-4JXXR78-2/2/3cd4421aa9a954d4a701c2c9941d7786)
Abstract:
The intra-oral processing of semi-solids foods is dominated by effects due to tongue movement. These movements subject the food to shear forces and mix it with saliva. Both actions tend to reduce the viscosity of the products. These changes are perceived as 'melting' by sensory panellists. In a previous study where subjects were trained to use a variety of intra-oral manipulation it was shown that the amount of tongue movement was an important factor in determining the sensory experience of the products. The goal of this study was to develop a system which could measure changes in viscosity due to temperature, shear, dilution and structure breakdown, monitor the rate of and extent of mixing, mimic the pattern of mixing extant in the mouth. Simulation requires that shear forces, mixing and thermal effects be mimicked faithfully. To compare samples recovered from the mouth with those mixed in the simulator we compare the amount of mixing as measured using an image-processing technique. The simulator allows the effects of shear, dilution, and [alpha]-amylase concentration on the rheology and heterogeneity of the product to be monitored in real time. By way of example the effects of dilution, shear and chemical breakdown are compared in a starch-based semi-solid food.
Keywords: Oral processing; Saliva; Custard; Image processing; Rheology

Adrian M. Haiduc, John P.M. van Duynhoven, Patricia Heussen, Aleksander A. Reszka, Christel Reiffers-Magnani, Multivariate modelling of the microstructural quality of food emulsions based on NMR, Food Research International, Volume 40, Issue 4, Physical Properties VII - Food Structure and Functionality, May 2007, Pages 425-434, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.05.010.
(http://www.sciencedirect.com/science/article/B6T6V-4KGX84T-1/2/d8b51c6b17f43acf25d90dce0a88fc57)
Abstract:
Understanding the relations between sensory/physical parameters and the underlying microstructural features is an essential step for designing and manufacturing novel food products. `Deductive' strategies to derive such structure-property relationships operate on time-scales, which do not match with the currently required pace of research and development. In this work an `inductive' approach has been outlined that deploys benchtop spectroscopic NMR and NIR measurements and multi-variate data analysis in order to generate explorative models that relate microstructure and functional parameters. Using protein-stabilised oil-in-water model emulsions, the use of a partial least squares and a multi-linear regression approach for processing and analysis of time-domain NMR data is demonstrated, and benchmarked against the deployment of NIR spectroscopy.
Keywords: Multivariate; NMR; Emulsions; Modelling; NIR

Miriam Friedemann, Enterobacter sakazakii in food and beverages (other than infant formula and milk powder), International Journal of Food Microbiology, Volume 116, Issue 1, 1 May 2007, Pages 1-10, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.12.018.
(http://www.sciencedirect.com/science/article/B6T7K-4MTC6CS-C/2/9407638f014948e471422ec0d5f0d8fd)
Abstract:
The ubiqitous microorganism Enterobacter sakazakii is a rare contaminant of infant formula and may cause severe systemic infection in neonates. So far, other food is not known to cause E. sakazakii-infections. The scarce information about the ecology of E. sakazakii and the uncertainty concerning the source of infection in children and adults warrant a summary of the current knowledge about the presence of this opportunistic microorganism in food other than infant formula. This review systematizes publications on the presence of E. sakazakii in food and beverages until June 2006. Food other than infant formula has been rarely investigated for the presence of E. sakazakii. Nevertheless, this microorganism could be isolated from a wide spectrum of food and food ingredients. E. sakazakii was isolated from plant food and food ingredients like cereal, fruit and vegetables, legume products, herbs and spices as well as from animal food sources like milk, meat and fish and products made from these foods. The spectrum of E. sakazakii-contaminated food covers both raw and processed food. The kind of processing of E. sakazakii-contaminated food was not restricted to dry products. Fresh, frozen, ready-to-eat, fermented and cooked food products as well as beverages and water suitable for the preparation of food, were found to be contaminated by E. sakazakii. Although E. sakazakii-contaminated food do not have general public health significance, measures for prevention should consider the presence of E. sakazakii in food, food ingredients, their processing and preparation as possible source of contamination, colonization or infection.
Keywords: Enterobacter sakazakii; Animal food; Vegetable food; Drinking water

Y. Ghafir, B. China, K. Dierick, L. De Zutter, G. Daube, A seven-year survey of Campylobacter contamination in meat at different production stages in Belgium, International Journal of Food Microbiology, Volume 116, Issue 1, 1 May 2007, Pages 111-120, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.12.012.

(http://www.sciencedirect.com/science/article/B6T7K-4MTC6CS-2/2/b3399aaf84ffa14742207ea5d0de4ba1)
Abstract:
The presence of Campylobacter was assessed in different samples of poultry, pork and beef meat and carcasses from slaughterhouses, production plants and retail level. An introductory study from 1997 to 1999, had the purpose of establishing the optimum dilution to detect changes in prevalence and allowed a semi-quantitative estimation of poultry and pork contamination. Following this, between 2000 and 2003, 4254 samples were taken in order to study the trends. The poultry matrixes represented the greatest number and the most highly contaminated samples, with 30.9% (in 0.01 g) positive samples, 18.7% (in 1 g), 46.9% (in 25 g) and 19.6% (in 0.01 g) for broiler carcasses, broiler fillets, prepared chicken and layer carcasses, respectively. Broiler carcasses and fillets sampled at retail level were significantly less contaminated than samples from production plants. Pork, beef and veal samples were rarely contaminated and, where contamination existed, it was at a low prevalence (maximum 5.0%). The high and unvarying prevalence of Campylobacter in poultry necessitates the implementation of intervention measures at the primary production level, in addition to methods of minimizing cross-contamination at the processing level. A survey plan in line with the present study could be used in the future to monitor the effects of the planned measures and performance objectives and to follow the evolution of Campylobacter contamination at all stages of the food chain, in accordance with European legislation.
Keywords: Foodborne pathogens; Campylobacter; Meat; Poultry; Pork; Beef

An-Chi Tsuei, Gwyneth V. Carey-Smith, J. Andrew Hudson, Craig Billington, Jack A. Heinemann, Prevalence and numbers of coliphages and Campylobacter jejuni bacteriophages in New Zealand foods, International Journal of Food Microbiology, Volume 116, Issue 1, 1 May 2007, Pages 121-125, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.12.028.
(http://www.sciencedirect.com/science/article/B6T7K-4MV0M6H-9/2/3565986e26a8c03aff96f180e6c30897)
Abstract:
Vegetable samples were tested for the presence of coliphages. None of the 55 samples contained these phages at concentrations greater than 10 g- 1 (the limit of detection). Spiking and recovery experiments indicated that the method was efficient at detecting coliphage T4 added to the food, and so it was concluded that phage titres were not being falsely underestimated. In addition 51 samples of chicken skin from retail portions were tested for the presence and numbers of coliphages and for presence only of Campylobacter jejuni phages. Coliphages were isolated from 46 samples (90.2% positive), at up to 2570 PFU 10 g sample- 1 but no C. jejuni phages were isolated. Several other methods were used to isolate C. jejuni phages from retail chicken but none was successful. However, when pooled whole chicken rinses from 39 flocks were tested for the presence of C. jejuni phages, 11 (28.2%) of the flocks were positive. It is possible that phages present on birds at the start of processing were either inactivated or simply diluted out during spin chilling. These data add to the body of information indicating that phages can readily be isolated from certain foods and indicate that consumers are exposed to them on a regular basis.
Keywords: Bacteriophage; Vegetables; Chicken; Campylobacter

Carlos Bengoechea, Abdessamad Arrachid, Antonio Guerrero, Sandra E. Hill, John R. Mitchell, Relationship between the glass transition temperature and the melt flow behavior for gluten, casein and soya, Journal of Cereal Science, Volume 45, Issue 3, May 2007, Pages 275-284, ISSN 0733-5210, DOI: 10.1016/j.jcs.2006.08.011.
(http://www.sciencedirect.com/science/article/B6WHK-4MKV2MD-1/2/a6e3eb303921553993e18c53ea3b0a88)
Abstract:

The effects of moisture content (25-45% wwb) and temperature (75-120 [degree sign]C) on the viscosity of gluten, soya and rennet casein systems was studied using a capillary rheometer. An attempt was made to relate the viscosities to the glass transition temperature measured by differential scanning calorimetry, dynamic mechanical thermal analysis and the phase transition analyzer. The temperature where the material flowed was also determined by the latter technique. All three-protein systems showed shear and extension thinning. Over the shear rate range investigated (~1-103 s-1), gluten had a substantially lower viscosity than the other two proteins, although the difference was less pronounced at the highest temperature studied. This low viscosity is reflected by lower values of the glass transition temperature, the melt flow temperature and the dynamic moduli E' and E'' in the rubbery state. The results are discussed in terms of the structure and heat induced changes for the three proteins and their relevance to food processing considered.
Keywords: Glass transition; Viscosity; Rheology; Extrusion; Differential scanning calorimetry; Dynamic mechanical thermal analysis; Phase transition analyzer; Plasticization; Protein

Oscar Gonzalez-Rios, Mirna L. Suarez-Quiroz, Renaud Boulanger, Michel Barel, Bernard Guyot, Joseph-Pierre Guiraud, Sabine Schorr-Galindo, Impact of 'ecological' post-harvest processing on the volatile fraction of coffee beans: I. Green coffee, Journal of Food Composition and Analysis, Volume 20, Issues 3-4, The essential balance: Risks and benefits in food safety and quality, May 2007, Pages 289-296, ISSN 0889-1575, DOI: 10.1016/j.jfca.2006.07.009.
(http://www.sciencedirect.com/science/article/B6WJH-4MR7D7J-1/2/9e84254fbf935046a95a4c499194cbcb)
Abstract:
Green coffees produced by three variants of the wet process and a new 'ecological' process were characterised for their aroma using combined headspace solid-phase microextraction/gas chromatography-mass spectroscopy (HS-SPME/GC-MS) and headspace solid-phase microextraction/gas chromatography-olfactometry (HS-SPME/GC-O). The effect of each post-harvest processing operation on the volatile fraction of the coffee produced was studied, particularly the effect of reducing the amount of water used in the process. The comparison of the green coffees from the different treatments revealed the importance of mucilage removal in distinguishing between the samples, and showed the merits of microbial mucilage removal in water to obtain coffees with a better aroma quality. These latter coffees were in fact characterised by pleasant and fruity aromatic notes, whereas those obtained after mechanical mucilage removal used in the ecological process were characterised by volatile compounds with an unpleasant note.
Keywords: Green coffee; Post-harvest process; Aroma; Solid-phase microextraction (SPME); Gas chromatography-olfactometry (GC-O); Food safety

Oscar Gonzalez-Rios, Mirna L. Suarez-Quiroz, Renaud Boulanger, Michel Barel, Bernard Guyot, Joseph-Pierre Guiraud, Sabine Schorr-Galindo, Impact of 'ecological' post-harvest processing on coffee aroma: II. Roasted coffee, Journal of Food Composition and Analysis, Volume 20, Issues 3-4, The essential balance: Risks and benefits in food safety and quality, May 2007, Pages 297-307, ISSN 0889-1575, DOI: 10.1016/j.jfca.2006.12.004.
(http://www.sciencedirect.com/science/article/B6WJH-4MNR0HY-1/2/d7cf883e9a6400b69c2383c4ffdc098b)
Abstract:
The purpose of this study was to determine how water and microbial stages in post-harvest processing affect the volatile content of coffee. Following our aroma analysis carried out on green coffees, we turned our attention to roasted coffees. Coffees produced by three variants of the wet method, and by an ecological process, were compared after roasting. Three degrees of roasting were applied to gain a clearer picture of the differences in roasted coffee aromas by means of a volatile compound analysis. Changes in the post-harvest process actually led to aroma differences

in roasted coffees, and with light roasting it was possible to more effectively distinguish between the four treatments based on aroma criteria. Coffee produced by the traditional wet method, with microbial stages, had a better aroma quality than coffee produced by the ecological method, which was purely mechanical. Moreover, in the microbial method, mucilage removal under water gave coffees with more fruity, floral and caramel notes, whereas dry mucilage removal gave more neutral coffees. These results confirmed the importance of microbial mucilage removal under water and tallied with the results of our previous study on green coffee. This work provides coffee producers and roasters with an insight into the volatile composition of roasted coffee depending on the post-harvest process used and degree of roasting applied.
Keywords: Roasted coffee; Post-harvest treatment; Aroma; SPME; GCO; Food safety

D. Suresh, H. Manjunatha, Krishnapura Srinivasan, Effect of heat processing of spices on the concentrations of their bioactive principles: Turmeric (Curcuma longa), red pepper (Capsicum annuum) and black pepper (Piper nigrum), Journal of Food Composition and Analysis, Volume 20, Issues 3-4, The essential balance: Risks and benefits in food safety and quality, May 2007, Pages 346-351, ISSN 0889-1575, DOI: 10.1016/j.jfca.2006.10.002.
(http://www.sciencedirect.com/science/article/B6WJH-4MR1RRF-2/2/e12a42701f016eca482615890c2c0c8f)
Abstract:
Studies were made to examine the loss of curcumin, capsaicin and piperine, the active principles of turmeric (Curcuma longa), red pepper (Capsicum annuum) and black pepper (Piper nigrum), respectively, as a result of subjecting the spices to domestic cooking processes. This involved heat treatment of each of these spices by: (i) boiling for 10 min, (ii) boiling for 20 min and (iii) pressure cooking for 10 min. Quantitation of the spice principles in the organic solvent extracts of the freeze-dried cooked spice samples was made with an appropriate HPLC method. Significant loss of spice active principles was observed when the spices were subjected to heat processing. Curcumin loss from heat processing of turmeric was 27-53%, with maximum loss in pressure cooking for 10 min. Curcumin loss from turmeric was similar even in the presence of red gram. In the presence of tamarind, the loss of Curcumin from turmeric was 12-30%. Capsaicin losses from red pepper ranged from 18% to 36%, with maximum loss observed in pressure cooking. Presence of either red gram or tamarind or both did not influence the loss of capsaicin. Piperine losses from black pepper ranged from 16% to 34%, with maximum loss observed in pressure cooking. The loss was somewhat lower in the presence of red gram. The results of this investigation indicated diminished availability of spice active principles from cooked foods when the food ingredients have been subjected to either boiling or pressure cooking for few minutes.
Keywords: Capsaicin; Curcumin; Piperine; Loss during heat processing; Spice principles; Turmeric; Curcuma longa; Red pepper; Capsicum annuum; Black pepper; Piper nigrum

D. Ou, G.S. Mittal, Single-sided pan frying of frozen hamburgers with flippings for microbial safety using modeling and simulation, Journal of Food Engineering, Volume 80, Issue 1, May 2007, Pages 33-45, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.03.033.
(http://www.sciencedirect.com/science/article/B6T8J-4JXXR4R-7/2/88d6e4b0aa870fbc94c5ca109fb63230)
Abstract:
Mathematical heat and mass (moisture and fat) transfer models for the single-sided pan-frying of frozen hamburger patties were developed and validated against experimental data. The slowest microbial inactivation point within a patty was predicted using transport and microbial inactivation models. The simulation results demonstrated the inactivation of Escherichia coli O157:H7, Listeria innocua, and Salmonella serotypes within patties during cooking. The effects of various turning intervals, patty thickness, initial patty temperature and D (thermal death time) values on safe process time were analyzed. Increasing the number of overturns by reducing flipping interval

reduced the process time considerably at lower pan temperature. Small variations of D had significant differences on process time also at lower pan temperature. E. coli can be satisfactorily inactivated at required final cooking temperature but not Salmonella and Listeria where higher process times are needed for the same temperature.
Keywords: Hamburger; Pan frying; Cooking; Food safety; Meat processing; Process modeling; Simulation

A.K. Datta, Porous media approaches to studying simultaneous heat and mass transfer in food processes. I: Problem formulations, Journal of Food Engineering, Volume 80, Issue 1, May 2007, Pages 80-95, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.05.013.
(http://www.sciencedirect.com/science/article/B6T8J-4KGG1G3-3/2/251f9bf0465515f7396d3b1f2ff8fc8c)
Abstract:
Heat and mass transfer formulations appearing in the food processing literature are synthesized in a systematic and comprehensive way, under the umbrella of transport in porous media. The entire range of formulations starting from the most fundamental to the semi-empirical are covered. Relationships of different formulations to each other and to the fundamental conservation laws are shown. The important transport mechanism in foods governed by the Darcy's law is emphasized. Food processing examples of various formulations are provided.
Keywords: Darcy; Capillary; Interface; Evaporation; Model

M. Valero, N. Recrosio, D. Saura, N. Munoz, N. Marti, V. Lizama, Effects of ultrasonic treatments in orange juice processing, Journal of Food Engineering, Volume 80, Issue 2, May 2007, Pages 509-516, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.06.009.
(http://www.sciencedirect.com/science/article/B6T8J-4KKWVGM-1/2/92e84f873cb399643e1a48f539112076)
Abstract:
The influence of ultrasound and conventional heating under different processing conditions on the inactivation and potential subsequent growth of micro-organisms in orange juice was investigated. Although a limited level of microbial inactivation ([less-than-or-equals, slant]1.08 log CFU ml-1) was obtained by selected batch ultrasonic treatment: 500 kHz/240 W for 15 min, microbial growth was observed in the substrate following 14 days of storage at both refrigeration (5 [degree sign]C) and mild abusive (12 [degree sign]C) temperatures. The presence of pulp in the juice increased the resistance of micro-organisms to ultrasound. After continuous ultrasonic treatments at flow rates of 3000 L h-1 negligible reductions of microbial counts were obtained. No ultrasound-related detrimental effects on the quality attributes of juice (limonin content, brown pigments and colour) were found. Therefore, to prevent the development of food-borne pathogens in orange juice it will be necessary to combine ultrasound with other processing methods with greater antimicrobial potency, as well as to achieve a very low initial concentration of bacteria, yeast and moulds in the juice. Such combinations will require further exploration of important synergistic effects that are relevant for industrial use. In this regard, the use of ultrasound in combination with mild heating for industrial use is discussed.
Keywords: Food processing; Non-thermal technologies; Ultrasound; Orange juice; Citrus juice; Hurdle technology

S. Arazuri, C. Jaren, J.I. Arana, J.J. Perez de Ciriza, Influence of mechanical harvest on the physical properties of processing tomato (Lycopersicon esculentum Mill.), Journal of Food Engineering, Volume 80, Issue 1, May 2007, Pages 190-198, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.05.008.
(http://www.sciencedirect.com/science/article/B6T8J-4KBDW8C-2/2/b5bb39ed6d2fcdbb93afe6f83531f744)

Abstract:
Data on physical properties of agro-food materials are valuable because they are needed as input to models predicting the quality and product behaviour. The correlation between laboratory test variables and the quality of tomato harvesting will contribute to develop an optimal solution for mechanisation. Firmness and skin resistance are the most relevant properties in quality characterisation of the tomatoes processed in the canning industry. Most of mechanical actions affecting tomatoes are produced during harvest and transport causing a falling-off in tomato quality. In order to determine the influence of mechanical harvest, tomato varieties were mechanical harvested and evaluated in laboratory. Impact test showed loss firmness in tomato from the bottom of the trailer up to 30%. The loss of tomato skin resistance to crack was about 6%.
Keywords: Tomato; Harvester; Physical properties; Quality; Mechanization

Yang Meng, Hosahalli S. Ramaswamy, Visualization of particle/liquid movements in high viscous fluids during end-over-end rotation, Journal of Food Engineering, Volume 80, Issue 2, May 2007, Pages 545-552, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.06.015.
(http://www.sciencedirect.com/science/article/B6T8J-4KTMTN4-2/2/327ed2b0e969a879f809574d8d83fd0d)
Abstract:
A flow visualization study was carried out to observe the relative movement of particles in viscous fluids in containers subjected to simulated flow conditions representing thermal processing of cans under end-over-end agitation. Experiments were carried out in a pilot scale, single cage rotary retort. Transparent glass containers were used in place of the cans; Nylon particles were employed to simulate the food particles. All experiments were carried out at room temperature, with the processing vessel door held open for video taping. However, the concentration of carboxymethyl cellulose was adjusted to match those at higher temperatures so that particle mixing behavior prevailing at thermal processing conditions could be observed at room temperatures. Results showed that in low viscous fluids, the particle mixing was rapid; the particle movement was strong; the particle rotation was more frequent and the mixed fluid flow existed in the entire region of the container. On the contrary, in particulate high viscous fluids, the particle mixing was slow; the particle movement was weak; the particle rotation was restricted and the fluid flow was confined to the region along the wall of the container. The results implied that the heat transfer could easily influenced by particle to fluid relative motion and that observed differences in heat transfer in the different particulate fluid systems could be related in some way to particle motion in the can.
Keywords: Flow observation; High viscosity fluid; Particulate; Rotational retort

E. Patazca, T. Koutchma, V.M. Balasubramaniam, Quasi-adiabatic temperature increase during high pressure processing of selected foods, Journal of Food Engineering, Volume 80, Issue 1, May 2007, Pages 199-205, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.05.014.
(http://www.sciencedirect.com/science/article/B6T8J-4KB10VV-1/2/2d8445d77a2e0e77120ba7f2a19e94be)
Abstract:
The effect of food composition on the quasi-adiabatic temperature increase during high pressure processing (HPP) was studied using specially designed experimental equipment. [delta]S was evaluated as the ratio of the temperature increase with respect to final pressure. Selected foods (mayonnaise dressing, egg yolk raw fresh, egg white raw fresh, Hass avocado, beef ground 90% lean meat, chicken breast fat free raw, whole and skim milk, gravy beef canned) were evaluated at an initial temperature of 25 [degree sign]C and pressure treatments ranging from 150 to 600 MPa. The effect of initial temperature (1-70 [degree sign]C) on the [delta]S over a range of pressures treatments from 150 to 600 MPa was evaluated using vegetable oil, honey and cream cheese. Results showed that vegetable oil had the highest [delta]S (upto 9.7 [degree sign]C/100 MPa) of

the samples examined. This [delta]S value decreased with increasing pressure and was slightly affected by initial temperature of the sample. For foods with high water content, [delta]S increased with increasing initial temperature. An empirical equation was developed to calculate the final temperature during HPP at different initial temperatures for vegetable oil, honey and cream cheese. The observed thermal effects of compression must be taken into account when HPP sterilization or pasteurization processes are developed.
Keywords: Heat of compression; High pressure of foods; Pressure and thermal effects; Pressure and food composition

Catherine A. Nalesnik, Charles I. Onwulata, Michael H. Tunick, John G. Phillips, Peggy M. Tomasula, The effects of drying on the properties of extruded whey protein concentrates and isolates, Journal of Food Engineering, Volume 80, Issue 2, May 2007, Pages 688-694, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.06.029.
(http://www.sciencedirect.com/science/article/B6T8J-4KV2R6W-2/2/a1b01f106bf9b0482e357abcbbd50c6c)
Abstract:
Extruded whey protein concentrate (WPC) and extruded whey protein isolate (WPI) are new food materials that may be used to fortify foods, and as such, the effects of drying on their physical properties need to be investigated for efficiency in milling and blending. Extruded WPC and extruded WPI at an initial moisture content of about 30% w.b. and 37% w.b., respectively, were dried to a final moisture of about 21% w.b. at 40 [degree sign]C and to a final moisture of about 14% w.b. at 70 [degree sign]C. Color, density, and texture measurements were made as a function of drying time. No significant change in color was observed at 40 [degree sign]C or 70 [degree sign]C for either material as it dried. Density increased slightly with drying time for extruded WPC at 40 [degree sign]C and 70 [degree sign]C, and extruded WPI at 70 [degree sign]C. Texture, measured as linear distance, increased in magnitude with drying time. Significant differences ($p < 0.05$) in texture at a drying time of 90 min, corresponding with a moisture of about 20% w.b. to 25% w.b. for extruded WPC and extruded WPI, were observed. Such a transition in texture may indicate that drying to a moisture of 20% w.b. to 25% w.b. is adequate for extruded whey proteins.
Keywords: Color; Density; Drying; Extrusion processing; Linear distance; Texture; Whey protein concentrate; Whey protein isolate

Nazrul I. Shaikh, Vittal Prabhu, Model predictive controller for cryogenic tunnel freezers, Journal of Food Engineering, Volume 80, Issue 2, May 2007, Pages 711-718, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.04.064.
(http://www.sciencedirect.com/science/article/B6T8J-4KSVFSV-1/2/d0d81bc9089bef381e5510360bf1b744)
Abstract:
Cryogenic freezing is an upcoming food processing technology that is gaining popularity because of the lower setup costs and improved food quality when compared to mechanical freezing. However, high operating costs are its major deterrent: the cost of cryogenic freezing is almost eight times that of its mechanical counterpart, and this is mainly attributed to the cost of the cryogen that is used. When the variability in the input heat load and/or the product characteristics is high, the economics become highly unfavorable due to either over or under freezing, which in turn imply either excess use of cryogen or reduced throughput. There is therefore a need for a good control mechanism that will minimize the losses due to over or under freezing while maintaining the required throughput. Current industrial freezers use programmable logic controllers (PLCs), which have conservative set-points and consequently significant operational costs. This paper proposes and tests the design of a model predictive control (MPC) algorithm with a zero absolute error (ZAE) minimizer that addresses these issues simultaneously. The controller

combines features of feedback-feedforward control to adjust cryogen consumption and throughput rate of the tunnel freezers to minimize the deviation of the end temperature of the food product from the desired set point temperature at the outlet. The stability, accuracy and robustness of the proposed method are tested on a simulation model. The controller guarantees stability, and for an input variance of 10%, the average deviation of the temperature from the set point was found to be less that 0.25%.
Keywords: Cryogenic tunnel freezers; Model predictive control; Simulation

Sencer Buzrul, Hami Alpas, Modeling inactivation kinetics of food borne pathogens at a constant temperature, LWT - Food Science and Technology, Volume 40, Issue 4, May 2007, Pages 632-637, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.02.019.
(http://www.sciencedirect.com/science/article/B6WMV-4JKRWMF-3/2/302a350c768f7d04fe53d40c2ef7b6c4)
Abstract:
Four food borne pathogens (Listeria monocytogenes CA and Ohio2, Salmonella enteritidis FDA and Salmonella typhimurium E21274, Escherichia coli O157:H7 931 and 933, Staphylococcus aureus 485 and 765) were inactivated under mild temperature (60 [degree sign]C) and their survival curves determined at selected time intervals. Tailing was observed in all survival curves as a monotonic upward concavity. The resulting survival curves were either described by the Weibull or traditional first-order model and goodness of fit of these models was investigated. Regression coefficients (R2), root mean square error (RMSE) and correlation plots suggested that Weibull model produced a better fit to the data than the traditional model. Hazard plots suggested that the Weibull model was fully appropriate for the data being analysed. Although more studies should be carried out to evaluate the applicability of the nonlinear models, the present study has shown that thermal process calculations should most probably be reconsidered. This could lead to a reduction in under- and over-processing of thermally treated foods
Keywords: Listeria monocytogenes; Salmonella; Escherichia coli; Staphylococcus aureus; Thermal inactivation; Weibull; First-order model

Monica Scordino, Alfio Di Mauro, Amedeo Passerini, Emanuele Maccarone, Highly purified sugar concentrate from a residue of citrus pigments recovery process, LWT - Food Science and Technology, Volume 40, Issue 4, May 2007, Pages 713-721, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.03.007.
(http://www.sciencedirect.com/science/article/B6WMV-4K1X8BJ-1/2/0217b1d8e580149fb1e2c6c6585fd8a3)
Abstract:
Pigmented orange pulp wash (PW), a byproduct of citrus processing, was already studied to obtain anthocyanins and hydroxycinnamates using adsorption resins. The residue of such process was further investigated to obtain a purified sugar concentrate applying a series of resin adsorptions and membrane techniques. The final product and the intermediates were characterized by chemical and microbiological analyses. The results have shown that anthocyanins, limonoids, flavanones and hydroxycinnamates were absent in the starting material because totally removed by the treatment with the neutral polystyrene-divinylbenzene (PS-DVB) resin used to recover the pigments; the acidity was strongly reduced through a weakly basic ion-exchange matrix while the ultrafiltration (UF) process stabilized the product by removal of enzymes and microorganisms. Eighty percent of the water was eliminated by a reverse osmosis (RO) treatment, increasing the sugar concentration by four times. The final product (28 Brix) contained about 250 g/l of sugars (glucose, fructose and sucrose), 9 g/l of citric acid and 1 g/l of pectins. The concentrate, obtained from a residue that otherwise must be disposed, was a transparent liquid of slight amber color with a very low microbial count and could easily find application as a natural sweetener in food and beverage industries.

Keywords: Adsorption on resins; Combined technologies; Membrane techniques; Pulp wash; Sugar recovery

Anil Kumar Anal, Harjinder Singh, Recent advances in microencapsulation of probiotics for industrial applications and targeted delivery, Trends in Food Science & Technology, Volume 18, Issue 5, May 2007, Pages 240-251, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.01.004.
(http://www.sciencedirect.com/science/article/B6VHY-4MXBF95-1/2/d42861d01127182f341428c9c20648e5)
Abstract:
Because of their perceived health benefits, probiotics have been incorporated into a range of dairy products, including yoghurts, soft-, semi-hard and hard cheeses, ice cream, milk powders and frozen dairy desserts. However, there are still several problems with respect to the low viability of probiotic bacteria in dairy foods. This review focuses mainly on current knowledge and techniques used in the microencapsulation of probiotic microorganisms to enhance their viability during fermentation, processing and utilization in commercial products. Microencapsulation of probiotic bacteria can be used to enhance the viability during processing, and also for the targeted delivery in gastrointestinal tract.

M. Nitschke, S.G.V.A.O. Costa, Biosurfactants in food industry, Trends in Food Science & Technology, Volume 18, Issue 5, May 2007, Pages 252-259, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.01.002.
(http://www.sciencedirect.com/science/article/B6VHY-4MWGFCV-1/2/a1365bfc55270e4e4982a4b1cd991306)
Abstract:
The increasing environmental concern about chemical surfactants triggers attention to microbial-derived surface-active compounds essentially due to their low toxicity and biodegradable nature. At present, biosurfactants are predominantly used in remediation of pollutants; however, they show potential applications in many sectors of food industry. Associated with emulsion forming and stabilization, antiadhesive and antimicrobial activities are some properties of biosurfactants, which could be explored in food processing and formulation. Potential applications of microbial surfactants in food area and the use of agroindustrial wastes as alternative substrates for their production are discussed.

Emmanuelle Pales Espinosa, Laurent Barille, Bassem Allam, Use of encapsulated live microalgae to investigate pre-ingestive selection in the oyster Crassostrea gigas, Journal of Experimental Marine Biology and Ecology, Volume 343, Issue 1, 30 April 2007, Pages 118-126, ISSN 0022-0981, DOI: 10.1016/j.jembe.2006.12.002.
(http://www.sciencedirect.com/science/article/B6T8F-4MYMP6N-2/2/81cbcdb1c9437d9e6311bbce6919a23d)
Abstract:
The involvement of algal chemical cues in the pre-ingestive selection of food particles in Crassostrea gigas was studied using a new approach. Live cells of two microalgal species, Nitzschia closterium and Tetraselmis suesica, were separately entrapped in small alginate microcapsules using an emulsification/internal gelation method. Microcapsule size was adjusted to be within the range of particles ingested by oysters. Using this technique, about 80% of microcapsules had a diameter ranging from 21 to 100 [mu]m. The monitoring of entrapped algae showed that phytoplankton cells remained alive and maintained an active growth for at least 24 days. In particle selection bioassays, adult C. gigas were fed a mixture of microcapsules containing the above algae species as well as control empty alginate microcapsules. The comparison of the proportions of each microcapsule type in the diet and in pseudofeces revealed that those containing T. suesica were significantly ingested while those containing N. closterium

were preferentially rejected. Since microcapsule material (alginate matrix) prevented physical contacts between algae cells and oyster feeding organs, this study clearly demonstrate that extracellular metabolites produced by microalgae play a crucial role in the pre-ingestive selection of particles in suspension-feeding bivalves.
Keywords: Alginate; Beads; Bivalve; Feeding; Microalgae; Particle processing

Shin-Hee Kim, Cheng-i Wei, Antibiotic resistance and Caco-2 cell invasion of Pseudomonas aeruginosa isolates from farm environments and retail products, International Journal of Food Microbiology, Volume 115, Issue 3, 20 April 2007, Pages 356-363, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.12.033.
(http://www.sciencedirect.com/science/article/B6T7K-4MW31Y2-1/2/ec08ec9a44b1492fb554e440e8067cb1)
Abstract:
The potential pathogenicity of Pseudomonas aeruginosa isolates from food animals, retail meat products, and food processing environments was evaluated by determining their antibiotic resistance profiles and invasiveness into human intestinal Caco-2 cell. In general, the genomically diversified isolates of P. aeruginosa were resistant to [beta]-lactams (ampicillin, amoxicillin-clavulanic acid, cefoxitin, ceftiofur, and cephalothin), chloramphenicol, tetracycline, kanamycin, nalidixic acid, and sulfamethoxazole-trimethoprim. Acquisition of any other antibiotic resistance genes, such as class 1 integrons and other [beta]-lactamase genes, was not found in the tested isolates. The expression of OprM membrane protein, which is associated with a multidrug efflux system, played a major role in their antibiotic resistance. Single mutation in the GyrA to confer resistance to nalidixic acids was also found in the tested isolates, indicating that these factors could synergistically affect the resistance of the P. aeruginosa isolates. The number of bacteria invading into the Caco-2 cells was 2.5 log10 CFU/ml on average. Therefore, the public health concern of P. aeruginosa could be relevant since its occurrence in food animals could cross contaminate the retail meat products during food handling and processing.
Keywords: Pseudomonas aeruginosa; Antibiotic resistance; Efflux system; Invasiveness

Alexa C. Rosypal, Dwight D. Bowman, Daniel Holliman, George J. Flick, David S. Lindsay, Effects of high hydrostatic pressure on embryonation of Ascaris suum eggs, Veterinary Parasitology, Volume 145, Issues 1-2, 10 April 2007, Pages 86-89, ISSN 0304-4017, DOI: 10.1016/j.vetpar.2006.11.001.
(http://www.sciencedirect.com/science/article/B6TD7-4MMFVX0-1/2/885b061f5f08fb9a47e5c23344942567)
Abstract:
High hydrostatic pressure processing (HPP) has been shown to be an effective non-thermal means of inactivating microorganisms from various food products. Little information is available regarding the effects of HPP on metazoan parasites. Outbreaks of food-borne disease have been associated with importation of food contaminated with fecal material. Ascaris suum is used as a surrogate model metazoan parasite for the human roundworm, Ascaris lumbricoides, to study the effects of treatments on the inactivation of eggs in sludge. The present study was conducted to determine the effects of HPP on A. suum eggs. Unembryonated A. suum eggs were subjected to 138-552 megapascals (MPa) for 10-60 s in a commercial HPP unit. Embryonation was induced after HPP treatments by incubating eggs in 0.01N sulfuric acid at room temperature. After 21 days, 100 eggs were examined per treatment using a light microscope and the percent of embryonated eggs was determined. Embryonation was induced in 38-76% eggs that were subjected to 138 and 270 MPa. No embryonation was observed in eggs exposed to pressures of 241 MPa or more for 60 s or in eggs exposed to 276 MPa for 10-30 s. These results indicate that HPP treatment could be used to protect contaminated food items by inactivating A. suum eggs and may also have potential in reducing food-borne illness resulting from fecal contamination.

Keywords: Ascaris suum; Eggs; High hydrostatic pressure; High pressure processing

J.S. Torrecilla, L. Otero, P.D. Sanz, Optimization of an artificial neural network for thermal/pressure food processing: Evaluation of training algorithms, Computers and Electronics in Agriculture, Volume 56, Issue 2, April 2007, Pages 101-110, ISSN 0168-1699, DOI: 10.1016/j.compag.2007.01.005.
(http://www.sciencedirect.com/science/article/B6T5M-4N0XN8T-1/2/056804f92666a92198ae19f9fd99a025)
Abstract:
The aim of the current paper is to obtain, through a proper selection of the training algorithm, an optimized artificial neural network (ANN) able to predict two parameters of interest for high-pressure (HP) food processing: the maximum or minimum temperature reached in the sample after pressurization and the time needed for thermal re-equilibration in the high-pressure process. To do that, 13 training algorithms belonging to 4 broad classes (gradient descent, conjugate gradient, quasi-Newton algorithms and Bayesian regularization) have been evaluated by training different ANNs. The network trained with the Levenberg-Marquardt algorithm showed the best overall predictive ability. The performance of this network was subsequently optimized by varying the number of nodes in the hidden layer, the learning coefficient and the decrease factor of this coefficient, and selecting the configuration with the highest predictive ability. The optimized ANN was able to make accurate predictions for the variables studied (temperature and time). These predictions were significantly better than those obtained by a previous ANN developed without selection of the training algorithm, that is, assuming the default option of the ANN computational package (gradient descent with a user-defined learning rate). We have shown that a correct selection of the training algorithm allows maximizing the predictive ability of the artificial neural network.
Keywords: Artificial neural network; Training algorithm; Modeling; High-pressure; Thermal control; Food processing

Jonathan Rason, Jean-Francois Martin, Eric Dufour, Annick Lebecque, Diversity of the sensory characteristics of traditional dry sausages from the centre of France: Relation with regional manufacturing practice, Food Quality and Preference, Volume 18, Issue 3, April 2007, Pages 517-530, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2006.07.002.
(http://www.sciencedirect.com/science/article/B6T6T-4MFTVJ5-1/2/a3bce0631633b8f874fefffa4015ce03)
Abstract:
Quality labelling of traditional products may be based on identifying specific sensory properties and linking these to particular compositional characteristics or manufacturing practices. Methodology to do this in the presence of large sensory variation is required. In order to study the sensory diversity of traditional dry sausages, a typology was performed on the small scale food processing facilities in the centre of France and this identified six types of small-scale facilities with specific manufacturing practice. From these six groups, 15 small-scale facilities were chosen in order to perform a QDA(R) test on dry sausages with a panel of 11 trained assessors who used 24 attributes related to appearance, texture, aroma and flavour. The list of attributes used by the panel was composed of terms such as marinade aroma, roast aroma, wine flavour and roast flavour which may be specific to traditional dry sausages. The major variation among the products was related to the type of the raw material used and to the texture of the dry sausages linked to the drying time. Hierarchical cluster analysis on the sensory data led to six groups of traditional dry sausages. These sensory groups did not exactly correspond to the groups given by the typology. However, a high correlation was found by canonical correlation analysis between the typology data and the sensory data on the first factors. Moreover, the discriminant analysis showed that it was possible to classify 100% of the traditional dry sausages into specific manufacturing practice

groups based on the sensory data. The methodology used in this study is well adapted for the attribution of quality labels to products manufactured by a group of producers on a defined territory.
Keywords: Traditional dry sausages; Manufacturing practice; Sensory profile; Chemometry

Theodoros H. Varzakas, G. Chryssochoidis, D. Argyropoulos, Approaches in the risk assessment of genetically modified foods by the Hellenic Food Safety Authority, Food and Chemical Toxicology, Volume 45, Issue 4, April 2007, Pages 530-542, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.07.009.
(http://www.sciencedirect.com/science/article/B6T6P-4KRFV4X-1/2/08d0a307765fb3e0a1131e45066ebdf0)
Abstract:
Risk analysis has become important to assess conditions and take decisions on control procedures. In this context it is considered a prerequisite in the evaluation of GM food. Many consumers worldwide worry that food derived from genetically modified organisms (GMOs) may be unhealthy and hence regulations on GMO authorisations and labelling have become more stringent. Nowadays there is a higher demand for non-GM products and these products could be differentiated from GM products using the identity preservation system (IP) that could apply throughout the grain processing system. IP is the creation of a transparent communication system that encompasses HACCP, traceability and related systems in the supply chain. This process guarantees that certain characteristics of the lots of food (non-GM origin) are maintained 'from farm to fork'.
This article examines the steps taken by the Hellenic Food Safety Authority to examine the presence of GMOs in foods. The whole integrated European legislation framework currently in place still needs to be implemented in Greece. Penalties should be enforced to those who import, process GMOs without special licence and do not label those products. Similar penalties should be enforced to those companies that issue false certificates beyond the liabilities taken by the food enterprises for farmers' compensation.
We argue that Greece has no serious reasons to choose the use of GMOs due to the fact that the structural and pedologic characteristics of the Greek agriculture favour the biological and integrated cultivation more. Greece is not in favour of the politics behind coexistence of conventional and GM plants and objects to the use of GMOs in the food and the environment because the processor has a big burden in terms of money, time and will suffer a great deal in order to prove that their products are GMO free or that any contamination is adventitious or technically unavoidable.
Moreover, Greece owns a large variety of genetic material that should try to protect from patenting and commercialisation. Finally, we should be aware of the requirements of movement of GMOs within borders, i.e. GMOs grown or used in other countries but which are not intended to cross into Greece, since Greece is very close to countries that are non-EU. This is where the development of a new, integrated, trustworthy and transparent food quality control system will help to satisfy the societal demands for safe and quality products. On the other hand, Greece should not be isolated from any recent scientific technological development and should assess the possible advantages for some cultivation using a case by case approach.
Finally, the safety assessment of GM foods and feed has been discussed according to the risk assessment methodology applied by EFSA.
Keywords: Genetically modified foods; Risk assessment; Hellenic food safety authority

D. Burfoot, R.T. Whyte, D.B. Tinker, K. Hall, V.M. Allen, A novel method for assessing the role of air in the microbiological contamination of poultry carcasses, International Journal of Food Microbiology, Volume 115, Issue 1, 1 April 2007, Pages 48-52, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.10.012.

(http://www.sciencedirect.com/science/article/B6T7K-4MFJJ0H-1/2/d396885f76944011cf77f7c560281abc)
Abstract:
This paper describes a novel method of measuring the contamination of raw foods with airborne bacteria during primary processing. To demonstrate the approach, this study aimed to quantify the role of airborne bacteria in the contamination of broiler chicken carcasses undergoing processing in an evisceration room. Settle plates and broiler carcasses were exposed to the evisceration room air or to ultra-clean air provided by a high efficiency particulate air (HEPA) unit located within the room. The use of ultra-clean air reduced the total aerobic counts on horizontal settle plates by 68-fold, and on vertical settle plates by 14-fold. The use of ultra-clean air had no significant effect on the total aerobic counts on carcasses as measured by sponging (3.5 log10 CFU cm- 2) or skin excision (4.0 log10 CFU cm- 2). The novel approach was able to show that the carcasses entering the room were so heavily contaminated that the airborne bacteria in the evisceration room contributed less than 1% of the total numbers of bacteria on the carcasses.
Keywords: Contamination; Airborne bacteria; Evisceration; Poultry

C. Curt, J. Hossenlopp, G. Trystram, Control of food batch processes based on human knowledge, Journal of Food Engineering, Volume 79, Issue 4, April 2007, Pages 1221-1232, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.04.052.
(http://www.sciencedirect.com/science/article/B6T8J-4K0D7W5-2/2/7a9f6e6a93ab2b7ad7fabb2665af7208)
Abstract:
Batch-to-batch methodologies use the repetitive nature of batch processes in order to determine the optimal operating policy in the presence of uncertainty. In this paper, a general and flexible framework for batch-to-batch control alone or combined with feedback control is proposed: it constitutes a novel multivariable technique for batch processes implemented to obtain a product having a predetermined set of characteristics at the end of the run. This control technique relies on human knowledge used as a tool for evaluating product quality and controlling processes. It was used to control two food processing operations: the chopping operation for manufacturing meat emulsion and the ripening operation applied to obtain the dry sausage. An experimental validation is introduced: the results show that the algorithm is likely to be able to control the process so as to obtain the desired sensory characteristics.
Keywords: Batch-to-Batch control; Decision-support system; Human knowledge

Janet E.L. Corry, Stephen J. James, Graham Purnell, Catia S. Barbedo-Pinto, Yann Chochois, Mary Howell, Christian James, Surface pasteurisation of chicken carcasses using hot water, Journal of Food Engineering, Volume 79, Issue 3, April 2007, Pages 913-919, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.03.018.
(http://www.sciencedirect.com/science/article/B6T8J-4JT836T-2/2/764f89f0a41d3694b44920cdca0e2984)
Abstract:
Immersion in hot water is one of many potential methods for reducing levels of pathogenic bacteria on the surface of poultry meat. Purnell et al. [Purnell, G., Mattick, K., & Humphrey, T. (2004). The use of `hot wash' treatments to reduce the number of pathogenic and spoilage bacteria on raw retail poultry. Journal of Food Engineering, 62, 29-36] developed and evaluated an experimental in-line processing unit for poultry carcasses using hot water immersion, identifying suitable time/temperature treatments. Microbiological testing was carried out on naturally contaminated carcasses fresh from the production line. These results, though promising, were difficult to evaluate because of the variations found in natural microbial counts. Thus the times/temperatures identified by Purnell et al. The use of `hot wash' treatments to reduce the number of pathogenic and spoilage bacteria on raw retail poultry. Journal of Food Engineering, 62, 29-36.] have been

evaluated in laboratory trials carried out on poultry carcasses artificially inoculated with Escherichia coli K12 and Campylobacter jejuni AR6 using a pilot batch immersion system developed for the project. Overall, reductions of 1.31 log10 cfu cm-2 in counts of E. coli K12 was achieved using a 20 s, 80 [degree sign]C treatment. A 1.66 log10 cfu cm-2 reduction in C. jejuni AR6, was achieved by a 30 s, 75 [degree sign]C treatment.
Keywords: Decontamination; Hot water; Poultry; Campylobacter jejuni; Escherichia coli

S. Ko, S. Gunasekaran, Error correction of confocal microscopy images for in situ food microstructure evaluation, Journal of Food Engineering, Volume 79, Issue 3, April 2007, Pages 935-944, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.03.014.
(http://www.sciencedirect.com/science/article/B6T8J-4JKC5N4-5/2/28901ac01047db442bcadf6e16567b68)
Abstract:
Image processing methods were developed for correcting confocal microscopy images for errors introduced during image acquisition and subsequent three-dimensional (3-D) image reconstruction. These include corrections for aberrations due to refractive index mismatch, light attenuation with sample depth, uneven intensity across image layers, and image misalignment. These procedures were validated using a simulated image with different illumination conditions. As example applications, dynamic changes in microstructure of process cheese during heating and gelation of [beta]-lactoglobulin (whey protein) were studied in situ. The error-corrected image layers were used to reconstruct a 3-D composite image of fat globules in cheese. The techniques presented will allow objective evaluation of in situ changes in 3-D microstructural features in different foods.
Keywords: 2-D images; 3-D reconstruction; Cheese; Confocal microscopy; Image processing; Microstructure; Whey protein isolate

M. Asgher, M. Javaid Asad, S.U. Rahman, R.L. Legge, A thermostable [alpha]-amylase from a moderately thermophilic Bacillus subtilis strain for starch processing, Journal of Food Engineering, Volume 79, Issue 3, April 2007, Pages 950-955, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.12.053.
(http://www.sciencedirect.com/science/article/B6T8J-4JKJGGP-2/2/0970a20a37263fa5b7e331460e8386e7)
Abstract:
A newly isolated Bacillus subtilis JS-2004 strain was cultured in liquid media containing waste potato starch to produce [alpha]-amylase. The effect of calcium, yeast extract and glucose supplementation of the production medium on bacterial growth and enzyme production was studied. Maximum enzyme production 72 U/mL was achieved after 48 h cultivation at pH 7.0 and 50 [degree sign]C. Addition of calcium and yeast extract enhanced microbial growth and enzyme production, where as glucose at 1.0% level showed a strong repression. Studies on crude [alpha]-amylase characterization revealed that optimum activity was at pH 8.0 and 70 [degree sign]C. The enzyme was quite stable for 1 h at 60 and 70 [degree sign]C, while at 80 and 90 [degree sign]C, 12% and 48% of the original activities were lost, respectively. After incubation of crude enzyme solution for 24 h at pH 8.0 at 70 [degree sign]C, a decrease of about 6% of its original activity was observed. The enzyme was activated by Ca2+ (relative activity 117%). It was strongly inhibited by Co2+, Cu2+, and Hg2+ but less affected by Mg2+, Zn2+, Ni2+, Fe2+, and Mn2+. The B. subtilis JS-2004 strain produced high levels of thermostable [alpha]-amylase with characteristics suitable for application in starch processing and food industries.
Keywords: Thermostable [alpha]-amylase; Bacillus subtilis JS-2004; Media optimization; Characterization; Starch processing

Teresa De Pilli, Barbara F. Carbone, Anna G. Fiore, Carla Severini, Effect of some emulsifiers on the structure of extrudates with high content of fat, Journal of Food Engineering, Volume 79, Issue 4, April 2007, Pages 1351-1358, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.04.054.
(http://www.sciencedirect.com/science/article/B6T8J-4K0D7W5-4/2/c41fa5587de75bdc33e24dc0d3636e12)
Abstract:
A study on extruded foods with wheat flour, almond flour, water and four kinds of emulsifiers (soy lecithin (SL), sucrose esters (SE), mono-glycerides (MG) and mono- and di-glycerides (MDG) of fatty acids) was carried out. In particular, the effects of these additives on the oil loss, which occurs during extrusion processing, and the structural characteristics of extrudates were evaluated.
Results showed that the sucrose esters were the most suitable emulsifier to reduce oil loss and to give the best structure of the extrudates (highest percentage porosity and smallest breaking strength).
Keywords: Emulsifier; Extrusion; Fatty flour; Almond; Sucrose esters

J. Qiao, N. Wang, M.O. Ngadi, S. Kazemi, Predicting mechanical properties of fried chicken nuggets using image processing and neural network techniques, Journal of Food Engineering, Volume 79, Issue 3, April 2007, Pages 1065-1070, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.03.026.
(http://www.sciencedirect.com/science/article/B6T8J-4JRT32V-5/2/8e385dd03ddbb83eb8c1724b2b0b42c8)
Abstract:
Typical approaches for measuring mechanical properties of fried food products are mostly destructive techniques. In this study, a non-destructive, image-based method was evaluated for predicting mechanical properties of fried, breaded chicken nuggets. The textural parameters of interest, namely maximum load, energy to break point, and toughness of fried chicken nuggets were measured. Values of the parameters changed over frying time. Images of the chicken nuggets were collected at different frying stages and five image texture indices were extracted using co-occurrence matrix. A multiple-layer feed-forward neural network was established to predict the three mechanical parameters. The correlation coefficients of the predicted results with those from mechanical tests were above 0.84.
Keywords: Image texture; Mechanical properties; Crispness; Co-occurrence matrix

Joseph Haddad, Ralf Greiner, Karim Allaf, Effect of instantaneous controlled pressure drop on the phytate content of lupin, LWT - Food Science and Technology, Volume 40, Issue 3, April 2007, Pages 448-453, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.02.008.
(http://www.sciencedirect.com/science/article/B6WMV-4JHMJY2-2/2/7952a70f6ca12eeb3a783f90586c0b90)
Abstract:
Although legumes provide health benefits, they also contain antinutritional factors like phytate. Excessive amounts of phytate in the diet can lead to mineral deficiencies and phytate should be eliminated by processing. During food processing and digestion, phytate can be dephosphorylated to produce degradation products such as myo-inositol pentakis-, tetrakis-, tris-, bis-, and monophosphates. This paper reports the effect of instantaneous controlled pressure drop (Detente Instantanee Controlee, or DIC) treatment on the phytate content of Lupinus albus and Lupinus mutabilis seeds. The results show the potential of the DIC process for the treatment of lupin seeds: phytate content decreased by 16% (L. albus) and 19% (L. mutabilis) after 1 min of DIC treatment and by up to 55% (L. albus) and 60% (L. mutabilis) after a 7 min treatment.
Keywords: Lupin; Phytate; Antinutrients; Processing; Controlled instantaneous pressure drop.

Margareth Overland, Odd Helge Romarheim, Oystein Ahlstrom, Trond Storebakken, Anders Skrede, Technical quality of dog food and salmon feed containing different bacterial protein sources and processed by different extrusion conditions, Animal Feed Science and Technology, Volume 134, Issues 1-2, 1 March 2007, Pages 124-139, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.05.014.
(http://www.sciencedirect.com/science/article/B6T42-4KDBM38-1/2/8812c5c4c3b2ffef0c564d2981d7094e)
Abstract:
The effect of basic bacterial protein meal (BPM) and bacterial protein meal homogenate (HOM) on length, expansion, density, sinking rate, fat leakage, durability, and breaking force of extruded dog food and salmon feed exposed to mild and moderate processing conditions was evaluated. The treatment consisted of a control diet and four test diets where high-quality (low temperature dried; LT) fish meal was partly replaced with either 25 or 50 g BPM or HOM kg-1. The differences in processing characteristics were obtained by a combination of conditioner and extruder adjustments. Fat was added to the extruded diets by vacuum coating. In the dog diets, the inclusion of BPM and HOM resulted in shorter pellets with increased diametric expansion, and reduced dust percentage, sinking rate and breaking force, with the effect being in general greatest with the highest concentration. In general, moderate feed processing resulted in increased pellet length and expansion while sinking rate and fat leakage decreased in both the BPM and HOM diets. Neither BPM nor HOM affected fat leakage, but fat leakage decreased by moderate processing. In the salmon diets, dietary BPM and HOM increased density and breaking force, but decreased durability and had no effect on sinking rate or fat leakage of the extruded salmon pellets. A significant interaction between feed processing and bacterial protein source was found for pellet length and diameter. Moderate feed processing increased pellet length in the BPM diets but reduced pellet length and increased pellet expansion in the HOM diet. Moderate processing decreased durability and sinking rate of the pellets. Coefficients of total tract apparent digestibility (CTTAD) of the control, 50 g kg-1 BPM and 50 g kg-1 HOM dog diets exposed to mild and moderate feed processing were determined in mink. There was no significant effects of type of diet or feed processing on CTTAD of major dietary components. The results demonstrate that low amounts of BPM and HOM influenced the technical quality of extruded diets for dogs and salmon. The effect of BPM and HOM was different in dog food with higher starch content compared to the salmon feed with lower starch content, and was dependent on extrusion conditions.
Keywords: Bacterial protein meal; Homogenate; Dog; Fish; Feed processing

Sointu Leikas, Marjaana Lindeman, Katariina Roininen, Liisa Lahteenmaki, Food risk perceptions, gender, and individual differences in avoidance and approach motivation, intuitive and analytic thinking styles, and anxiety, Appetite, Volume 48, Issue 2, March 2007, Pages 232-240, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.09.009.
(http://www.sciencedirect.com/science/article/B6WB2-4MBBYH5-3/2/175b4e4d08e8b39cdd8fec62c7f1e5d9)
Abstract:
Risks appear to be perceived in two different ways, affectively and rationally. Finnish adult internet users were contacted via e-mail and asked to fill an internet questionnaire consisting of questions of food risks and measures of avoidance and approach motivation, analytic and intuitive information processing style, trait anxiety, and gender in order to find out (1) whether food risks are perceived two-dimensionally, (2) how individual differences in motivation, information processing, and anxiety are associated with the different dimensions of food risk perceptions, and (3) whether gender moderates these associations. The data were analyzed by factor, correlation and regression analyses. Three factors emerged: risk scariness, risk likelihood, and risks of cardiovascular disease. Personality and genderxpersonality interactions predicted food risk perceptions. Results showed that food risk perceptions generally form two dimensions; scariness

and likelihood, but that this may depend on the nature of the risk. In addition, results imply that individuals with high avoidance motivation perceive food risks as scarier and more likely than others, and that individuals with an analytic information processing style perceive food risks as less likely than others. Trait anxiety seems to be associated with higher food risk perceptions only among men.
Keywords: Food risk; Risk perception; Personality; Information processing; Motivation; Gender differences

Morten Omholt Alver, Torodd Tennoy, Jo Arve Alfredsen, Gunvor Oie, Automatic measurement of rotifer Brachionus plicatilis densities in first feeding tanks, Aquacultural Engineering, Volume 36, Issue 2, March 2007, Pages 115-121, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2006.09.002.
(http://www.sciencedirect.com/science/article/B6T4C-4KX2DD1-1/2/115fad378bb9ce843460f3672f9bf883)
Abstract:
Rotifers are an important live food in the culture of marine fish, but the process of measuring rotifer culture densities is time consuming. This is especially true at low densities such as those applied in first feeding tanks. A particle counter for making automatic measurements of rotifer densities has been designed. The instrument automatically extracts samples, and relies on a digital camera and image processing to measure the rotifer density. Due to its autonomous nature, the instrument is suited for use as a component in a process monitoring and control system.
The rotifer counter design is presented, and the statistical properties of the measurement derived. The accuracy achieved in practical countings is then investigated in a series of test counts. To assess the quality of measurements achieved in an actual first feeding tank with samples extracted from a single location, the rotifer counter is used in an experiment studying rotifer dynamics in a continuously diluted tank. The results indicate that the rotifers are approximately evenly distributed in the water column, and that one needs to consider rotifers attaching to the tank wall to be able to predict rotifer densities under these conditions. The experiment gives an example of the considerable potential for experimental work assisted by the automated rotifer counter.
Keywords: Rotifer; Density; Automatic measurement; First feeding

Meenakshi Tripathi, Subhash K. Khanna, Mukul Das, Surveillance on use of synthetic colours in eatables vis a vis Prevention of Food Adulteration Act of India, Food Control, Volume 18, Issue 3, March 2007, Pages 211-219, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.09.016.
(http://www.sciencedirect.com/science/article/B6T6S-4HTCTGJ-2/2/68085e240aafb4c2ef8a862e63fbbdaa)
Abstract:
Synthetic colours are added to foods to replace natural colour lost during processing, to reduce batch-to-batch variation and to produce products with consumer appeal where no natural colour exists. A study was carried out to find the type and level of synthetic food colours added to various eatables in the urban and rural areas of Lucknow. Inventory of coloured eatables showed that more types and varieties of coloured eatables were prevalent in the urban areas than in the rural areas. Of the total 1199 analyzed samples, 69% coloured eatables revealed the presence of permitted colours while 31% samples contained non-permitted colours. The use of non-permitted colours was found to be more in rural areas than in the urban areas. Also, more of the rural market samples contained permitted colours exceeding the maximum allowed prescribed levels as compared to urban markets. In urban areas, samples of crushed ice which are preferentially consumed by children population, the presence of Sunset Yellow FCF and Tartrazine was found to exceed the permissible limit by 8 and 20 times while in rural areas Sunset Yellow FCF, Tartrazine and Carmoisine exceeded the permissible limit by 23, 16 and 15 times, respectively. Non-permitted colours such as Rhodamine B, Metanil Yellow, Orange II, Malachite Green, Auramine,

Quinoline Yellow, Amaranth and Sudan dyes were identified in various foodstuffs. The use of these dyes is more common in the rural markets than in the urban markets. Extensive food quality monitoring and surveillance programmes are needed for exposure assessment and to safeguard the health of population at large.
Keywords: Synthetic food colours; Usage pattern; PFA act of India

Yuanxia Sun, Shigeru Hayakawa, Masahiro Ogawa, Ken Izumori, Antioxidant properties of custard pudding dessert containing rare hexose, d-psicose, Food Control, Volume 18, Issue 3, March 2007, Pages 220-227, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.09.019.
(http://www.sciencedirect.com/science/article/B6T6S-4HM7RWB-1/2/cfae139aa1877f8a7990b971bfa3e4b6)
Abstract:
Custard pudding (CP) is a sweet dessert composed of nutritionally valuable egg, milk and sucrose. In the present study, d-psicose (Psi), a noncalorie rare hexose, was added into raw materials of custard pudding as a substitute for sucrose in order to develop a new functional dessert. The antioxidant activities of cooked CP products were evaluated by different methods, including the analysis of the scavenging activities on ABTS+ and DPPH radicals, and ferric-reducing antioxidant power. The results showed that ethanolic extract from Psi-CP possessed the remarkable radical scavenging capacity and reducing power as compared to the extracts from CP products including alimentary sugars (sucrose and d-fructose). The quantitative evaluation of antioxidant activity based on Trolox equivalent antioxidant capacity (TEAC) was performed to compare Psi-CP with commercial pudding products. Among all tested pudding products, Psi-CP had the highest antioxidant activity. These data suggested that Psi-CP contained a considerable amount of antioxidant substances formed through Maillard reaction in food processing. Thus CP including the rare sugar was found to be an effective functional dessert for the prevention of some diseases associated with oxidative stress.
Keywords: Rare sugar; d-Psicose; Custard pudding; Antioxidant activity; Functional food

Manuela Guderjan, Pedro Elez-Martinez, Dietrich Knorr, Application of pulsed electric fields at oil yield and content of functional food ingredients at the production of rapeseed oil, Innovative Food Science & Emerging Technologies, Volume 8, Issue 1, March 2007, Pages 55-62, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.07.001.
(http://www.sciencedirect.com/science/article/B6W6D-4KXDWJW-1/2/c14863aa8cb6d0132400234ed9df950b)
Abstract:
In this study the effect of pulsed electric fields (PEF) on oil yield and content of functional food ingredients of rapeseed (Brassica napus) is discussed. For the analysis hulled and non-hulled rapeseed was used and solvent extraction or pressing for oil separation and oil quality were compared. In dependency of applied PEF treatment intensity (42-84 kJ kg- 1) oil yield increased by pressing as well as solvent extraction from and higher concentrations of tocopherols, polyphenols, total antioxidants and phytosterols were measured in the oil. No effect on unsaturated properties and saponification values were investigated, and higher concentration of chlorophyll and free fatty acids in the oil were determined. Besides PEF treatment and oil separation method the hulling of rapeseed has an obvious effect on oil quality.Industrial relevance
The application of pulsed electric fields as a nonthermal food processing technology is interesting for increased extraction processes of plant materials. For consumers gentle processed products get more and more interesting. Results of this study show, that pulsed electric fields can be used as a pretreatment before oil separation to increase oil yield and content of functional food ingredients under gentle conditions.
Keywords: Pulsed electric fields; Rapeseed; Rapeseed oil; Tocopherols; Polyphenols; Phytosterols

G.S. Tucker, H.M. Brown, P.J. Fryer, P.W. Cox, F.L. Poole II, H.-S. Lee, M.W.W. Adams, A sterilisation Time-Temperature Integrator based on amylase from the hyperthermophilic organism Pyrococcus furiosus, Innovative Food Science & Emerging Technologies, Volume 8, Issue 1, March 2007, Pages 63-72, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.07.003.
(http://www.sciencedirect.com/science/article/B6W6D-4KV8TGC-1/2/a94731ee64dc82ffc50603513044946b)
Abstract:
A candidate Time-Temperature Integrator (TTI) which is potentially suitable for use in validation of sterilisation processes was identified and tested. The TTI was based on the highly thermostable amylase produced from the extracellular medium of a Pyrococcus furiosus fermentation: this organism grows at temperatures in the region of 100 [degree sign]C. Kinetic properties for the amylase following inactivation by heat showed it to be suitable for use as a sterilisation TTI. Isothermal kinetic data at 121 [degree sign]C and non-isothermal kinetic data over the range 121 to 131 [degree sign]C were determined. A decimal reduction time (DT-value) at 121 [degree sign]C of 24 min was calculated from isothermal tests and a range from 18.1 to 23.9 min from non-isothermal tests. A z-value of 10 [degree sign]C was estimated from non-isothermal tests. Thus, sterilisation values (F0) estimated from this TTI would be similar to F0-values representative of the destruction of Clostridium botulinum spores. Industrial measurements under non-isothermal conditions were conducted in metal cans processed in an FMC reel and spiral cooker-cooler and a bar simulator, and also in plastic pouches processed in a Lagarde steam-air retort.Industrial relevance
Many food processes, such as canning, are based upon thermal sterilisation of the food material. The development of a reliable Time-Temperature Integrator for such a process would be industrially valuable by providing a simple way of validating such processes. This study demonstrates the feasibility of one such TTI.
Keywords: Time-Temperature Integrator; TTI; Sterilisation value; Thermal processing; Canning

Armand V. Cardello, Howard G. Schutz, Larry L. Lesher, Consumer perceptions of foods processed by innovative and emerging technologies: A conjoint analytic study, Innovative Food Science & Emerging Technologies, Volume 8, Issue 1, March 2007, Pages 73-83, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.07.002.
(http://www.sciencedirect.com/science/article/B6W6D-4KSSWDJ-1/2/c4dd9715d32e8a75688167fe16b54331)
Abstract:
Conjoint analytic surveys were administered to 225 potential consumers of foods processed by innovative and emerging food technologies in order to assess the factors contributing to their interest in using such products. Respondents included 1) a consumer panel of civilian lab employees, 2) shoppers in a mall in the northeastern U.S., and 3) U.S. military troops on training exercises. Respondents rated their interest in 49 different food product concepts that varied in food type, processing or production technology, costs, benefits, risks, endorsing agencies, and product information. Results showed that the relative importance of factors did not vary greatly among the consumer groups. Perceived risks associated with the technologies were the most important factors influencing interest in use. Among the emerging technologies assessed, irradiation and genetic modification resulted in the greatest negative effect on likely use, while high pressure processing produced the most positive effect. The term 'cold preservation' had positive associations for all groups, but 'minimally processed' had negative associations. Implications of the data for the marketing of foods processed by innovative and emerging technologies are discussed.Industrial relevance
The food industry is currently interested in a variety of novel production and processing technologies that may result in economical and improved quality products. However, consumer

attitudes toward and conceptions of these new technologies can greatly influence their success in the marketplace. The results of this study show that 'perceived risks' of the technologies are the most important determinant of interest in their use by consumers. This and other data uncovered in this study suggest that industry must be vigilant in their knowledge of consumer attitudes toward these processes in order to avoid unexpected failure of these products upon market introduction.

Begona Rubio, Beatriz Martinez, M Dolores Garcia-Cachan, Jordi Rovira, Isabel Jaime, Effect of high pressure preservation on the quality of dry cured beef 'Cecina de Leon', Innovative Food Science & Emerging Technologies, Volume 8, Issue 1, March 2007, Pages 102-110, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.08.004.
(http://www.sciencedirect.com/science/article/B6W6D-4M1TT1G-1/2/23f4903a4cd37b357ed6b77c74c4f4f4)
Abstract:
Microbiological, physicochemical and sensory quality of 'Cecina de Leon' vacuum packed was evaluated after high pressure treatment (500 MPa, 5 min) and further chilling storage at 6 [degree sign]C for up to 210 days. The objective was to determine if high pressure processing is a valid preservation method to reduce the growth of spoliage microorganisms without modification of its quality properties along of the chilling storage time for this Spanish beef dried meat product. Since, this product is usually presented to the consumer in vacuum packed slices and cuts, these two retail sale systems were studied. High pressure processing at 500 MPa for 5 min avoided the growth of enterobacteria, enterococci and pseudomonads and delayed the growth of lactic acid bacteria, Micrococcaceae and yeasts and moulds. Besides, no change was found after pressure treatment and during refrigerated storage, in physicochemical and sensory parameters. It could be concluded, on the basis of the results, that the high pressure treatment was an efficient method for preserving the safety of 'Cecina de Leon' without decreasing their sensory properties.Industrial relevance
High pressure processing is finding increasing use in the food industry because of its relative advantages versus other food processing methods in eliciting minimal changes in the flavour and nutritional qualities of the final product and in extending the shelf life. The study aimed the evaluation of microbiological, physicochemical and sensory characteristics at vacuum packed slices and cuts of 'Cecina de Leon' during subsequent extended chilled storage. High pressure processing was a valid preservation method to reduce the growth of spoilage microorganisms without any changes on 'Cecina de Leon' quality properties along wide chilled storage.
Keywords: Vacuum packaging; High pressure processing; Shelf-life; Dry cured beef; Cecina de Leon

Martina Lille, Karin Autio, Microstructure of high-pressure vs. atmospheric frozen starch gels, Innovative Food Science & Emerging Technologies, Volume 8, Issue 1, March 2007, Pages 117-126, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.08.002.
(http://www.sciencedirect.com/science/article/B6W6D-4M04J7W-1/2/a328fd767ee8baff441fedb9e76a26fb)
Abstract:
The aim of this study was to find out whether the ice crystal size of a starch gel, a model food system, could be reduced by high-pressure freezing compared with freezing at atmospheric pressure. The size and number of pores in thawed gels was determined by light microscopy and image analysis, and was taken as an indirect measure of ice crystals formed during the different freezing processes studied.
The pore size and the total area occupied by the pores were clearly reduced by high-pressure freezing at 150-240 MPa compared with freezing at atmospheric pressure at the same cooling rate. The pore size in the high-pressure (nor in the atmospheric) frozen gels did not increase

during a storage time of 3 months at - 24 [degree sign]C (still air) at atmospheric pressure.Industrial relevance
High-pressure processing at subzero temperatures is not yet industrially applied. More evidence on the benefits of high-pressure freezing or thawing on the quality of real food materials as well as development of processing equipment is needed for commercialization of the processes. This study demonstrates that the pore size of frozen and thawed starch gels can be reduced by high-pressure freezing compared with freezing at atmospheric pressure. The reduced pore size was assumed to be a result of smaller ice crystals formed in the high-pressure freezing process. Based on this study, no conclusions can be drawn on the possibility of high-pressure freezing to improve the quality of real foods of a more complex composition and structure.
Keywords: High-pressure; Freezing; Starch gel; Microscopy; Texture

S. Rozzi, R. Massini, G. Paciello, G. Pagliarini, S. Rainieri, A. Trifiro, Heat treatment of fluid foods in a shell and tube heat exchanger: Comparison between smooth and helically corrugated wall tubes, Journal of Food Engineering, Volume 79, Issue 1, March 2007, Pages 249-254, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.01.050.
(http://www.sciencedirect.com/science/article/B6T8J-4JHMF99-1/2/b44d83755b19ff99ce763f379b54693b)
Abstract:
Fluid foods are often subjected to thermal treatment inside surface heat exchangers. Besides the need for high heat transfer performance, also low friction losses and easy cleaning and sanitizing properties of the surface are imperative. In food process industry these requirements are often met by the shell and tube heat exchanger equipped with helically corrugated walls.
The present work concerns convective heat transfer and friction losses in helically enhanced tubes for both Newtonian and non-Newtonian fluids. Four fluid foods, namely, whole milk, cloudy orange juice, apricot and apple puree, are tested in a shell and tube heat exchanger. Both fluid heating and cooling conditions are considered.
The experimental outcome confirms that helically corrugated tubes are particularly effective in enhancing convective heat transfer for generalized Reynolds number ranging from about 800 to the limit of the transitional flow regime.
Keywords: Heat exchangers; Heat transfer enhancement; Corrugated walls; Non-Newtonian fluid foods; Fluid food thermal processing

J. Kim, R.G. Moreira, Y. Huang, M.E. Castell-Perez, 3-D dose distributions for optimum radiation treatment planning of complex foods, Journal of Food Engineering, Volume 79, Issue 1, March 2007, Pages 312-321, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.01.061.
(http://www.sciencedirect.com/science/article/B6T8J-4JGJHWF-9/2/0a1fe8f705862f0c040c8322ee1f85e6)
Abstract:
To obtain satisfactory e-beam irradiation of fresh products a strict process control is required to ensure that the dose delivered to all parts of the treated product falls within some specified range. As a basis of a dosimetry technique, assessment of the exact geometry of fresh products in a 3-D configuration is needed. Obtaining a uniform dose in inherently complex foods such as a chicken carcass is, however, difficult. The objective of this study was to obtain detailed, high-resolution dose distributions of a chicken carcass exposed to e-beam or X-ray irradiation using Monte Carlo simulation and Computer Tomography (CT) techniques.
We obtained multi-sliced CT data of a frozen chicken carcass to extract exact product geometry and densities using image-processing methods. The type of source energy input spectrum and source size were entered into the Monte Carlo N-Particle radiation transport code (MNCP5) to obtain dose distributions in the product. For low energy treatment (1.35 MeV electrons, Van de Graaff accelerator), dose absorption occurred up to 5-7 mm deep, resulting in surface irradiation of

the carcass. For high energy treatment (10 MeV, LINAC, bottom only), the doses within the carcass rose up to 1.2 times the incident dose with increasing depth and rapidly fell to low values. Two-sided (top and bottom) irradiation resulted in a dose uniformity ratio (Dmax/Dmin) of about 1.6. Two-sided X-ray irradiation significantly improved the uniformity ratio from 2.5 to 1.8.
Keywords: Electron beam; Dosimetry; Monte Carlo; Tomography

Y.W. Park, Rheological characteristics of goat and sheep milk, Small Ruminant Research, Volume 68, Issues 1-2, Goat and Sheep Milk, March 2007, Pages 73-87, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2006.09.015.
(http://www.sciencedirect.com/science/article/B6TC5-4M69JNX-1/2/c6cc6e5aaee1672fc345273c46b4ed89)
Abstract:
Rheology represents the properties of both solid and liquid foods, where texture is the rheology related to solid foods, and viscosity is the rheology of fluid foods. Three categories of tests measure textural characteristics of solids foods, empirical (ball compressor, penetrometer, curd tension meter), imitative (texturometer, texture profile analysis [TPA]), and fundamental tests (small amplitude oscillatory shear analysis [SAOSA], torsion analysis [TA]). Regardless of animal species, milk casein gels are mainly responsible for the rheological properties of cheese and other dairy products. In normal fluid milk, the viscosity is affected by the state and concentrations of fat, protein, temperature, pH, and age of the milk. Average milk viscosity has been determined for goats at 2.12 cPas, sheep 2.48 cPas, camels 2.8 cPas, buffaloes 2.2 cPas, and cows 1.7 cPas. Heating decreases the dynamic viscosity, but it increases at the point of coagulation. Sheep and goat milk have the same proteins as cow milk, but their proportions and genetic polymorphs differ widely, which explains different rennetabilities and considerable rheological variations in cheesemaking. Casein micelle structure is similar in goat, sheep, and cow milk, but differs in composition, size and hydration. Sheep milk has caseins richer in calcium than cow caseins, it is also very sensitive to rennet, because of higher [beta]/[alpha]s-casein ratio, and coagulation proceeds faster than in cow milk. Rheological studies with Monterey Jack cheese from goat milk found 'knitting' with progressing aging time, less hardness, less shear stress values, and more rubberiness. High correlations were noted between SAOSA scores and proteolysis in cheeses. Terrincho sheep cheese showed increased hardness, fracturability, gumminess, chewiness, yelloweness, decreased adhesiveness, resilience, and cohesiveness during ripening. Frozen storage of soft goat cheeses had minimal effects on textural qualities, which has valuable market implications. Feta cheeses showed increased compactness and porosity, when goat milk had been added to sheep milk. Yogurt studies, including Labneh from the Middle East, found highest viscosity for sheep followed by goats, cows, and camels, and viscosity increased with solids contents. Three different transient viscosity stages were described mathematically, and camel milk varied least in viscosity during yogurt gelation. Viscosity decreased with increasing angular velocity of the inner cylinder, suggesting that yogurt behaved as a shear-thinning non-Newtonian fluid. Rheological properties are important monitors of quality control in dairy processing and in scientific research.
Keywords: Goat milk; Sheep milk; Rheology; Texture; Viscosity; Texture profile analysis

G. Flachowsky, K. Aulrich, H. Bohme, I. Halle, Studies on feeds from genetically modified plants (GMP) - Contributions to nutritional and safety assessment, Animal Feed Science and Technology, Volume 133, Issues 1-2, Feed Safety, 1 February 2007, Pages 2-30, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.08.002.
(http://www.sciencedirect.com/science/article/B6T42-4KWTFD8-3/2/7fabb7d5ae72be82e04f8612caba9f70)
Abstract:

Since 1997, 18 studies with feeds from genetically modified plants (GMP) in the nutrition of dairy cows, growing bulls, growing and finishing pigs, laying hens, chicken for finishing as well as growing and laying quails were conducted at the Federal Agricultural Research Centre (FAL) in Braunschweig (Germany).
The majority of the experiments (16) were undertaken with GMP of the so-called first generation (plants with input traits and without substantial changes in composition) such as Bt-maize, Pat-maize, Pat-sugar beet, Gt-soybean, Gt-potatoes and Bt-potatoes. Two studies were carried out with GMP of the second generation (plants with output traits or with substantial changes in their chemical composition) such as an altered fatty acids profile in rapeseed or inulin potatoes. In all experiments, feeds from GMP were compared with their isogenic counterparts.
The iso- and transgenic feeds were analysed for their composition (proximates, fibre fraction, amino acids, fatty acid pattern, minerals) and undesirable substances (e.g., mycotoxins). Animal studies were carried out for nutritional and safety assessment such as digestibility, feed intake, health and performance of target animal species and quality of food of animal origin. Reproduction was studied in a 10-generation experiment with quails and a 4-generation experiment with laying hens. Duration of experiments and number of animals were limited in some cases due to small amounts of GM-feed available for experimentation.
Attention was drawn to the fate of DNA during feed processing (silage making, oil extraction), in the digestive tract of animals (slaughtering of animals 0, 4, 8, 12 and 24 h after feeding) and in the animal body (samples from several organs and tissues).
In agreement with more than 100 animal studies available to date, results show no significant differences in the nutritional value of feeds from GMP of the first generation in comparison with non-GMP varieties. To date, no fragments of recombinant DNA have been found in any organ or tissue sample from animals fed GMP. The lower content of mycotoxins in Bt-maize and side effects in GMP of the second generation are of safety concern.
The results indicate that routine feeding studies with target animal species add little to nutritional assessment of feed from GMP of the first generation, but they are of public interest and important for safety assessment. These studies will play a more important role in nutritional and safety assessment of feeds from GMP with output traits. Proposals for such studies were made on the basis of previous experiments.
Keywords: Genetical modified plants; Animal nutrition; Composition; Nutritional assessment; Fate of DNA

Trevor W. Alexander, Tim Reuter, Karen Aulrich, Ranjana Sharma, Erasmus K. Okine, Walter T. Dixon, Tim A. McAllister, A review of the detection and fate of novel plant molecules derived from biotechnology in livestock production, Animal Feed Science and Technology, Volume 133, Issues 1-2, Feed Safety, 1 February 2007, Pages 31-62, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.08.003.
(http://www.sciencedirect.com/science/article/B6T42-4KV2RR5-2/2/99fd8474ffc60321f546c92e49b4bf11)
Abstract:
Since the commercialization of the first genetically modified (GM) crop in 1996, the amount of arable land dedicated to the production of GM feed has increased significantly. Despite widespread adoption of GM foods and feeds, public perception of their safety remains mixed. To provide consumers the opportunity for choice, some countries have adopted mandatory labeling of GM foods and feeds when their adventitious presence exceeds a defined threshold percentage. Methods for detecting and quantifying GM plants in feeds include protein- and DNA-based assays, but their sensitivity may be influenced by the techniques used in feed processing. Interest in the consumption of transgenic protein and DNA has prompted investigations of their fate within the gastrointestinal tract of livestock and the potential to which transgenes or their products may be incorporated into tissues. Transgenic protein has not been detected in any animal tissues or

products. Fragments of DNA from endogenous, high-copy number chloroplast genes from plants have been detected in poultry, pig and ruminant tissues. Low-copy endogenous and transgenic DNA in animal tissues have been detected but to a lesser extent than high-copy genes. Current research suggests that the passage of dietary DNA fragments across the intestinal wall is a natural physiological event, the likelihood of which is dependent on their concentration in the feed. To date, the transgenic traits approved for expression in crops used as feeds have not posed a safety concern for livestock.
Keywords: Genetically modified plant; Genetically modified feed; Transgene detection; Gene transfer; Recombinant protein detection; Digestion

K.G. Maciorowski, P. Herrera, F.T. Jones, S.D. Pillai, S.C Ricke, Effects on poultry and livestock of feed contamination with bacteria and fungi, Animal Feed Science and Technology, Volume 133, Issues 1-2, Feed Safety, 1 February 2007, Pages 109-136, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.08.006.
(http://www.sciencedirect.com/science/article/B6T42-4MCWMD7-1/2/ddfb5ff9be04eeb8af0b6126a5f21181)
Abstract:
Animal feed may serve as a carrier for a wide variety of microorganisms. The primary mode of inoculation of feed materials is the transference of soil by wind, rain, mechanical agitation, or insects to standing crops. Some of the microorganisms are adapted to the desiccated and relatively nutrient-poor conditions in soil and survive in similar niches on growing crops. Gastrointestinal pathogens can also introduced into the food chain by animals defecating in the farm environment or by fertilization of crops with manures. Other microorganisms are introduced during storage. In general, the amount of available water in the feed matrix determines whether a microorganism will grow or survive. Some microorganisms, primarily moulds, are adapted to the low amount of available moisture and grow actively within stored seeds and grains. Others will produce spores or enter survival state until the moisture is high enough for bacterial action. There are numerous ways contaminating microorganisms can affect feed quality negatively including reducing dry matter and nutrients, causing musty or sour odours, causing caking of the feed and producing toxins. Finally, feed can act as a carrier for animal and human pathogens. The type of feed, processing treatments and storage conditions can all be factors that influence the population levels and types of microorganisms present. The incidence and variation in the microflora found in animal feed and feed materials are reviewed. A select number of important human and animal pathogens are discussed. Finally there is a brief overview over the detection, surveillance and management strategies of microbial contamination in feed and feed materials.
Keywords: Animal feed; Poultry feed; Microbial diversity; Feed quality; Control

S. Planchon, B. Gaillard-Martinie, S. Leroy, M.N. Bellon-Fontaine, S. Fadda, R. Talon, Surface properties and behaviour on abiotic surfaces of Staphylococcus carnosus, a genetically homogeneous species, Food Microbiology, Volume 24, Issue 1, February 2007, Pages 44-51, ISSN 0740-0020, DOI: 10.1016/j.fm.2006.03.010.
(http://www.sciencedirect.com/science/article/B6WFP-4JT83SN-2/2/27bec77d1857893f686d82996a722732)
Abstract:
This work aimed to characterize the surface properties of Staphylococcus carnosus and the influence of different media on their ability to adhere and grow on industrial supports. As their colonization could be dependant of the strain, the genetic diversity of the strains was studied. The diversity of 13 strains analysed by pulsed-field gel electrophoresis revealed that the S. carnosus strains formed a homogeneous genetic group. Their surface properties, characterized by studying their affinity to solvents, were hydrophilic with a strong negative surface charge. The S. carnosus strain CIT 833 hardly adhered to polytetrafluoroethylene (PTFE) and stainless steel chips. Tryptic

soy broth (TSB) was the most favourable medium for growth on stainless steel support while TSB/NaCl was better for growth on PTFE. Scanning electron microscopy (sem) showed that this strain weakly colonized both supports and did not form cell aggregates. Indeed, the strain did not synthesize polysaccharides. These results showed that S. carnosus adhered on different abiotic surfaces which are used in food factories but was not able to accumulate on these surfaces. The inability of S. carnosus to form biofilm could explain why S. carnosus is rarely isolated in meat processing environment.
Keywords: Genetic diversity; Surface properties; Bacterial colonization; Scanning electron microscopy; Polysaccharides

Paul Takhistov, Dimensionless analysis of the electric field-based food processes for scale-up and validation, Journal of Food Engineering, Volume 78, Issue 3, February 2007, Pages 746-754, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.11.015.
(http://www.sciencedirect.com/science/article/B6T8J-4JJG9WB-1/2/5bb5886eed1b36e89a62d9e04045e95e)
Abstract:
Electric field-based food processing technologies have recently caught the attention of food industry that wishes to fulfill consumers' demands for high-quality and safety of food products. Numerous research groups have recently demonstrated the possibility to inactivate different microorganisms in various buffer test systems and food products using electric field-based processing methods. In this work, the critical process parameters and the characteristics of food products that determine microbial inactivation kinetics are analyzed. Suggested analytical models are based on the dimensionless analysis of major process variables and physical properties of food products.
Keywords: Non-thermal processing; Dimensionless analysis; Processing scale-up

G. Donsi, G. Ferrari, G. Pataro, Inactivation kinetics of Saccharomyces cerevisiae by pulsed electric fields in a batch treatment chamber: The effect of electric field unevenness and initial cell concentration, Journal of Food Engineering, Volume 78, Issue 3, February 2007, Pages 784-792, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.11.027.
(http://www.sciencedirect.com/science/article/B6T8J-4J3WG5S-1/2/26690ab9ea4cd4bc2f4396d8ebe23c64)
Abstract:
Microbial inactivation of Saccharomyces cerevisiae inoculated in liquid and solid model foods and treated with PEF in a batch chamber with parallel plate electrodes was studied. Electric field strength, cumulated treatment time and initial microbial concentration were the main parameters investigated. Results obtained without promoting mixing of the liquid sample showed that, at any electric field strength, the inactivation kinetics of S. cerevisiae was represented by a non-linear relationship when the log10 of the survival fraction was plotted against treatment time. The maximum level of inactivation achieved was 4.51 log-cycles at an electric field intensity of 30.9 kV/cm and after a total process time of 1600 [mu]s. The intrinsic heterogeneity of PEF treatment was confirmed and found to be mainly due to a non-uniform distribution of the electric field in the treatment region. Simulating the agitation of liquid samples (Trizma buffer pH 7.2, k = 2 mS/cm) in the treatment chamber during pulse processing enhanced the effectiveness of microbial inactivation process. Experiments carried out immobilizing the yeast cells in a solid model food (Potato dextrose agar, pH 5.3 and k = 1.61 mS/cm at 25 [degree sign]C) allowed to confirm the existence of a dead space inside the treatment chamber due to field fringing effects. Tests carried out to study the effect of the initial concentration of S. cerevisiae cells in the range 103-108 CFU/ml on PEF processing effectiveness showed that the level of inactivation achieved increases with decreasing the initial concentration of microorganisms.

Keywords: Pulsed electric field; Microbial inactivation; Electric field strength; Treatment time; Initial cells concentration

C. Balerin, P. Aymard, F. Ducept, S. Vaslin, G. Cuvelier, Effect of formulation and processing factors on the properties of liquid food foams, Journal of Food Engineering, Volume 78, Issue 3, February 2007, Pages 802-809, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.11.021.
(http://www.sciencedirect.com/science/article/B6T8J-4J2W067-1/2/6587fba2d88f535bacdc560cfb857cdb)
Abstract:
The aim of this work was to determine the phenomena affecting bubble size, according to process conditions (pressure, flow rates, whipping rotation speed) and formulation properties. Model fluids were formulated in order to get simple and well-defined rheology. An instrumented foaming pilot-scale line was built and allowed us to monitor the process and to characterise bubble size under pressure, at the exit of the mixer.
Viscosity and rotation speed of the whipping head are the most influent parameters on foam morphology: interaction between these factors have been highlighted. Experimental measurements obtained were consistent with the critical Weber number since a corrected fluid viscosity is used. It seems indeed that the fluid viscosity is reduced in the whipping head, due to the presence of local heating. These temperature variations consequent to the shear of viscous fluids in a narrow-gap geometry were quantified and modelled as a function of shear rate and fluid viscosity.
Keywords: Foam; Processing; Bubble diameter; Weber number; Viscous dissipations

Michael Leung, Wing-Han Ching, Dennis Y.C. Leung, Gabriel C.K. Lam, Fluid dynamics and heat transfer in cold water thawing, Journal of Food Engineering, Volume 78, Issue 4, February 2007, Pages 1221-1227, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.10.042.
(http://www.sciencedirect.com/science/article/B6T8J-4JGJHWF-1/2/4ce7e6b131c836fe8d4fbc950b2df7cf)
Abstract:
Cold water thawing method using running water is most popular when frozen food is required to thaw within a short period of time. Although cold water thawing has long been used commonly in food processing, catering, as well as household cooking, most users do not fully understand the thawing mechanisms and behaviors, leading to poor time control, excessive consumption of water, and unnecessary waste water discharge. In this investigation, numerical modeling and experimental validation were conducted to study the important fluid dynamics and heat transfer in cold water thawing. Computational fluid dynamics (CFD) modeling was employed to analyze the water flow and convective heat transfer on the food surface. Inside the food body, the heat transfer by conduction with a moving phase-change interface was determined by finite difference (FD) method. A parametric study revealed the effects of the flow rate and temperature of the water inlet on the thawing process performance. It was found that the water flow rate could be much less than what commonly used to obtain virtually the same thawing performance. Finally, proper equipment design, control, and operation were recommended to achieve high thawing rate and efficient use of water.
Keywords: Cold water thawing; Moving phase-change interface; Computational fluid dynamics

V.P. Valdramidis, A.H. Geeraerd, F. Poschet, B. Ly-Nguyen, I. Van Opstal, A.M. Van Loey, C.W. Michiels, M.E. Hendrickx, J.F. Van Impe, Model based process design of the combined high pressure and mild heat treatment ensuring safety and quality of a carrot simulant system, Journal of Food Engineering, Volume 78, Issue 3, February 2007, Pages 1010-1021, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.12.051.

(http://www.sciencedirect.com/science/article/B6T8J-4K5SSTM-1/2/5203e7a972b6da04a66920be23f94b32)
Abstract:
In this research the combined mild heat and high pressure (HP) treatment of two food processing targets is under study: one microbiological safety target (Escherichia coli K12) and one quality related target (carrot Pectin Methylesterase, PME). A polynomial non-monotonous model structure fulfilling a number of constraints was identified for describing the log-linear inactivation kinetics of E. coli (at T = 5-45 [degree sign]C and P = 200-500 MPa). Similarly, a polynomial non-monotonous model structure is used in order to describe the evolution of the carrot PME inactivation kinetics at T = 10-65 [degree sign]C and P = 0.1-825 MPa. Iso-rate contour plots are constructed integrating the microbial and enzymatic kinetics for the combined T and P treatments. Additionally, the effect of the pressure build-up time (specific to the experimental set-up at hand) on the processing targets was quantified based on the microbial and enzymatic activity load before the initiation of the experiment and after the stabilisation of the treatment conditions. When T-P kinetic diagrams were constructed with combinations of treatments (also at extrapolation regions) resulting in the same log reductions, i.e., iso-reduction contour plots, it was evident that carrot PME was more resistant than E. coli. According to the analysis of the T-P diagrams (incorporating the pressure build-up processing effects), a thermal process in a range of 55-80 [degree sign]C, and a combined low temperature (30-50 [degree sign]C)-high pressure (700-800 MPa) process revealed to be equivalent.
Keywords: Predictive modelling; Secondary modelling; Polynomial models; Constrained optimisation; Kinetic diagrams; High pressure; Carrot PME; Escherichia coli

Andres Conesa, Francisco Artes-Hernandez, Sabine Geysen, Bart Nicolai, Francisco Artes, High oxygen combined with high carbon dioxide improvesmicrobial and sensory quality of fresh-cut peppers, Postharvest Biology and Technology, Volume 43, Issue 2, February 2007, Pages 230-237, ISSN 0925-5214, DOI: 10.1016/j.postharvbio.2006.08.016.
(http://www.sciencedirect.com/science/article/B6TBJ-4M0J4GS-3/2/e5fc3b1cd65c2f2aaec608c4625aefa0)
Abstract:
The effects of high O2 and high CO2 throughout storage on the microbial and sensory quality of fresh-cut bell peppers from two commercial `California' cultivars grown under different climatic conditions were studied. The `Meteor' cultivar was minimally processed in Leuven (Belgium) and the `Requena' cultivar in Cartagena (Murcia, Spain). The storage conditions were (kPa O2/kPa CO2/kPa N2) 100/0/0, 80/15/5, 60/0/40, 50/15/35, 20/15/65 and 21/0.03/[congruent with]79 as control. Bell peppers freshly-cut in cubes were stored at 5 [degree sign]C up to 9-10 days. Changes in total counts of mesophilic, psychrotrophic, yeasts and mould as well as Enterobacteriaceae were monitored. Individual and total sugars and organic acids contents, visual appearance, color, shriveling, off-aroma, crunchiness, flavor and overall quality were also evaluated. The results in both experiments showed that 80 or 50 kPa O2 combined with 15 kPa CO2 maintained the main sensory quality attributes and inhibited growth of the spoilage microorganisms and Enterobacteriaceae in minimally processed bell peppers.
Keywords: Minimal processing; Quality attributes; Bacteria; Yeast and mould; Food safety

Shu GENG, Tian-zhi REN, Mao-hua WANG, Technology and Infrastructure Considerations for E-Commerce in Chinese Agriculture, Agricultural Sciences in China, Volume 6, Issue 1, January 2007, Pages 1-10, ISSN 1671-2927, DOI: 10.1016/S1671-2927(07)60010-8.
(http://www.sciencedirect.com/science/article/B82XG-4MX6G4F-1/2/4a1fcdd503d19543270f572ee5dd58e6)
Abstract:

Information technology (IT) was one of the most intensively studied and extensively applied technologies in the 20th century and its research and application will be even more accelerated in the 21st century. The impact of IT is more far-reaching than any one may have had imagined, encompassing all facets and sectors of society. Economically, e-commerce generated more than $1.5 trillion in the US in 2004 and is projected to be 30, 15 and 2.6% of the total manufacturing, whole sales and retail sales in the US in 2006 respectively. IT research in agriculture has so far been particularly applied to such fields as precision farming and bioinformatics and in extension and farming practices. As such, its potential application in agricultural e-commerce has only begun to be explored. The United States Department of Agriculture has identified four different functions that e-commerce firms perform in the agricultural sector. They are: (1) information distribution, (2) input supply, (3) commodity trading floor, and (4) logistics/supply chain management. Unlike other industrial products, agricultural products are much more diverse and difficult to process and handle. For instance, fruits and vegetables are perishable and have to reach the market and the hands of consumers within a short period of time. One of the problems for IT applications in agriculture is the lack of standard measures in characteristics and quality of perishable produce and processing foods. Standards are pre-requisites for effective IT application and e-commerce. According to the Global Commerce Initiative, standards bring scalability, portability and affordability to the business process. Standards speed up the supply chain and reduce errors and protect technology investments and ensure system to system interaction and interoperability. Because the complexity of issues involved in standardization, the process of standardization must involve the input and discussion from all segments of the society. Being the largest agricultural country in the world and one of the most active trading partners in the international market, China must also be involved in determining the standards for both domestic and international trades. These measures are the necessary foundations for e-commerce in agriculture. In this paper, we provide a review of the technological development of standardization and coding that are prerequisites for IT application in e-commerce. This understanding is important for professionals in China to promote e-commerce in agriculture. Finally, we propose that a national committee to be formed in China, which includes IT experts from private sectors, academic professionals and governmental officials. This committee should consider the progress being made elsewhere in the world, the unique properties of Chinese commodities and appropriate business models to determine a set of standard measures that are transportable and communicable digitally in the world market for China's e-commerce in agriculture.
Keywords: information technology; standardization; e-commerce; agricultural product

P. Janczyk, H. Franke, W.B. Souffrant, Nutritional value of Chlorella vulgaris: Effects of ultrasonication and electroporation on digestibility in rats, Animal Feed Science and Technology, Volume 132, Issues 1-2, 1 January 2007, Pages 163-169, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.03.007.
(http://www.sciencedirect.com/science/article/B6T42-4JRVDXD-7/2/ecb4ffa8b1541480305f13e35e17a223)
Abstract:
Three processed products derived from the green algae C. vulgaris were investigated: (1) spray-dried only (S-DA); (2) spray-dried and electroporated (ES-DA); (3) spray-dried; ultrasonicated treated (US-DA). A nitrogen-balance study was performed. Male growing Wistar rats, housed separately in metabolism cages, were fed the three algal products as the sole protein source at 150 mg N per 100 g of body weight. A control group of rats was fed with casein at a level to give the same protein nitrogen intake. The coefficients of total intestinal tract apparent crude protein digestibility for the different C. vulgaris products were: S-DA = 0.47 +/- 0.127% (mean +/- S.D.), ES-DA = 0.44 +/- 0.075%, US-DA = 0.57 +/- 0.137%. Protein efficiency ratio was 1.4 +/- 0.3, 1.0 +/- 0.5 and 2.1 +/- 0.3, respectively. N-balance was 41.86 +/- 32.8 mg, 31.3 +/- 17.3 mg and 66.7 +/- 30.1 mg, respectively. The biological value was 93 +/- 9.5%, 93.6 +/- 10%, and 101 +/- 5%,

respectively. The coefficient of total intestinal tract apparent crude protein digestibility and biological value of C. vulgaris was enhanced by ultrasonic treatment and reduced by electroporating, thus ultrasonication may be a helpful technological process in practical processing of green algae in food industry.
Keywords: Chlorella vulgaris; Nutritional value; Protein digestibility; Rats

Olgaly Ramos-Rodriguez, James F. Campbell, Sonny B. Ramaswamy, Efficacy of the entomopathogenic nematode Steinernema riobrave against the stored-product insect pests Tribolium castaneum and Plodia interpunctella, Biological Control, Volume 40, Issue 1, January 2007, Pages 15-21, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2006.09.007.
(http://www.sciencedirect.com/science/article/B6WBP-4KY7T7F-1/2/3ac7a2b4d7f525b4a3a9b3fe78785c93)
Abstract:
Persistence of stored-product insects in hidden refugia and their subsequent movement into stored commodities resulting in product infestation contributes to their pest status and represents a potential target for biological control agents. Entomopathogenic nematodes have not been previously tested against stored-product insects in environments such as empty grain bins or food processing and warehouse facilities, but their effectiveness at finding and infecting hosts in other cryptic habitats has been demonstrated. In laboratory bioassays, Steinernema riobrave reduced survival of red flour beetle, Tribolium castaneum, larvae, pupae and adults from 77.9 +/- 3.2% in the controls to 27.4 +/- 2.5% in treatments. Temperature (25 and 30 [degree sign]C) and relative humidity (43, 56-57, 75, and 100%) did not significantly influence S. riobrave efficacy in this experiment. Field trials simulating empty grain bin treatments were conducted using red flour beetle and the Indian meal moth, Plodia interpunctella. Total survival of mixed stages (larvae, pupae and adults) of T. castaneum was 42% of that in the control and total survival of mixed stages of P. interpunctella was 27% of the control. Larval stages were the most susceptible to S. riobrave for both insect species with P. interpunctella larvae having 99% mortality and T. castaneum larvae having 80% mortality. S. riobrave shows promise as a biological control agent for stored-product insects, particularly Indian meal moth, but further studies looking at combinations of treatments may further enhance efficacy.
Keywords: Stored-products; Entomopathogenic nematodes; Steinernema riobrave; Tribolium castaneum; Plodia interpunctella

Iskender Arcan, Ahmet Yemenicioglu, Antioxidant activity of protein extracts from heat-treated or thermally processed chickpeas and white beans, Food Chemistry, Volume 103, Issue 2, 2007, Pages 301-312, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.07.050.
(http://www.sciencedirect.com/science/article/B6T6R-4M1TT63-B/2/e985d0991b9c5addd8e439ab6acd9261)
Abstract:
In this study, antioxidant activities of water-soluble protein extracts from chickpeas and white beans were investigated. The area under the curve (AUC) values of lyophilized crude protein extracts (dialyzed or undialyzed) from thermally processed (121 [degree sign]C for 20 min) or heat-treated (90 [degree sign]C for 20 min) chickpeas (73-91 [mu]mol trolox/g) and white beans (39-67 [mu]mol trolox/g) indicated a higher free radical-scavenging capacity and thermostability for chickpea proteins than for white bean proteins. The thermal processing also increased the Fe+2-chelating capacity of lyophilized chickpea crude protein extracts 1.8-fold whereas it caused a 2.3-fold reduction in the Fe+2-chelating capacity of lyophilized white bean crude protein extracts. Dialysis increased the protein content of lyophilized chickpea extracts 1.5-2-fold but it did not affect the protein content of lyophilized white bean extracts significantly. Ammonium sulfate precipitation was not effective for selective precipitation of antioxidant proteins. However, it improved the free radical-scavenging capacity of lyophilized protein extracts from thermally processed chickpeas and

white beans by almost 25% and 100%, respectively. DEAE-cellulose chromatography, indicated the presence of five (A1-A5) and three (B1-B3) antioxidant protein fractions in heat-treated and thermally processed chickpea protein extracts, respectively, and can be used for the partial purification of antioxidant proteins. The results of this study showed the good potential of chickpea proteins as thermostable natural food antioxidants.
Keywords: Legumes; Proteins; Radical scavenging; Antioxidant activity; Thermal stability

Luna Greco, Rossella Riccio, Sabina Bergero, Attilio A.M. Del Re, Marco Trevisan, Total reducing capacity of fresh sweet peppers and five different Italian pepper recipes, Food Chemistry, Volume 103, Issue 4, 2007, Pages 1127-1133, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.10.013.
(http://www.sciencedirect.com/science/article/B6T6R-4MCWB4M-1/2/6490193003f7a018e3b9ff4998892043)
Abstract:
Processing and preparation methods are generally believed to result in a depletion of naturally occurring antioxidants in food. To evaluate the antioxidant properties of fresh sweet peppers (Capsicum annuum) and five different Italian recipes based on sweet peppers (pickled; 'peperonata'; grilled; in sour-sweet condiment; salted), water- and lipid-soluble extracts from fresh and processed peppers were analysed using high-performance liquid chromatography coupled with an electrochemical detector. Total reducing capacity (TRC) and contributions of hydrophilic reducing capacity (HRC) and lipophilic reducing capacity (LRC) to the TRC were determined in all the samples. Three important antioxidant compounds were measured: ascorbic acid, [beta]-carotene and lycopene. The contribution of these individual compounds to TRC was estimated.
Fresh pepper had the highest TRC, the highest HRC and the greatest content of ascorbic acid. HRC and ascorbic acid content decreased with processing, whilst LRC was generally increased. Ascorbic acid was the major component of HRC in all samples (ranging from 72% in peperonata to 88% in fresh pepper), confirming the high content of this vitamin in peppers. Lycopene was detected only in peperonata. Many liposoluble compounds present in the lipophilic extract were not identified (only 6-20% of LRC was [beta]-carotene).
Keywords: HPLC; Electrochemical detector; Canned food; Mediterranean diet

Santiago P. Aubourg, Vanesa Losada, Marta Prado, Jose M. Miranda, Jorge Barros-Velazquez, Improvement of the commercial quality of chilled Norway lobster (Nephrops norvegicus) stored in slurry ice: Effects of a preliminary treatment with an antimelanosic agent on enzymatic browning, Food Chemistry, Volume 103, Issue 3, 2007, Pages 741-748, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.09.022.
(http://www.sciencedirect.com/science/article/B6T6R-4M69JWF-2/2/3b41d4229b8d6d46f3c20d4dad54ff1d)
Abstract:
The use of slurry ice is gaining increasing importance as an advanced method for the hygienic and efficient chilling and sub-zero storage of aquatic food products. In this work, this technology was applied as a novel technique for the chilling and storage of Norway lobster (Nephrops norvegicus) - a crustacean species of high-commercial value - under refrigeration conditions at -1.5 [degree sign]C. In addition, the effects of a preliminary treatment with 0.5% Na HSO3 on surface browning were evaluated and compared with the results obtained in control batches not subjected to such treatment. The processing of lobster in slurry ice significantly ($p < 0.05$) slowed down microbial spoilage, as determined by the counts of aerobes, psychrotrophs, proteolytic bacteria, and lactose-fermenting Enterobacteriaceae, and by the formation of volatile amines. Likewise, the autolytic breakdown mechanisms - as determined by the K value - were also significantly ($p < 0.05$) inhibited in the slurry ice batch. Remarkably, preliminary treatment with 0.5% sodium metabisulphite permitted better maintenance of the parameters involved in sensory quality - especially as regards the aspect of the carapace - as compared with non-treated batches, and

allowed a shelf life of 9 days without surpassing the 150 mg/kg legal limit established for this food additive. On contrast, the non-treated batch stored in slurry ice exhibited a shelf life of 5 days. The combination of technological treatments proposed in this work - preliminary antimelanosic treatment and storage in slurry ice - may be successfully applied to other fresh and frozen shellfish species with a view to extending shelf life and to avoiding the legal and toxicological problems derived from current abuse of such antimelanosic agents to prevent shellfish browning.
Keywords: Refrigeration; Melanosis; Ice slurries; Norway lobster; Sensory quality; Enzymatic browning

E.H. Tou, C. Mouquet-Rivier, I. Rochette, A.S. Traore, S. Treche, J.P. Guyot, Effect of different process combinations on the fermentation kinetics, microflora and energy density of ben-saalga, a fermented gruel from Burkina Faso, Food Chemistry, Volume 100, Issue 3, 2007, Pages 935-943, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.11.007.
(http://www.sciencedirect.com/science/article/B6T6R-4HYN594-1/2/89bf5ffa21c029eac63199bfa6efc3e4)
Abstract:
Three different processes combining cooking (C), addition of malt (M) and/or backslop inoculation (I) were investigated to increase the energy density (ED) of ben-saalga, a millet-based fermented gruel and their effects on fermentation kinetics and microbiological characteristics were assessed. In the process combining cooking and inoculation (CI) and in the control (traditional processing methods), glucose and fructose were the main sugars and their concentrations decreased during the settling step (fermentation). In the process combinations that included the addition of malt (CM and CMI), maltose was the main sugar that accumulated during settling. In the CM process combination, the start of fermentation was considerably delayed due to the marked reduction in natural microflora during cooking. In contrast, in the CI and CMI process combinations, inoculation by back slopping accelerated acidification, resulting in a pH value of below 4.0 after 7 h of fermentation. Although malt was added at a very low rate (0.125%), gruels made using CM and CMI process combinations, and prepared at a suitable consistency, had an ED close to or above 84 kcal/100 g of sweetened gruel, the minimum value required for complementary food.
Keywords: Pearl millet; Lactic acid fermentation; Sugars; Organic acids; Complementary food; Energy density; Malt

Ahmed E.M. Abdalla, Saeid M. Darwish, Eman H.E. Ayad, Reham M. El-Hamahmy, Egyptian mango by-product 2: Antioxidant and antimicrobial activities of extract and oil from mango seed kernel, Food Chemistry, Volume 103, Issue 4, 2007, Pages 1141-1152, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.10.026.
(http://www.sciencedirect.com/science/article/B6T6R-4MFJTNG-1/2/7d02b2a7de36e923b9953b7c46106b1a)
Abstract:
Egyptian mango seeds were collected as wastes from local fruit processing units, the kernels were separated and dried. The antioxidant and antimicrobial activities of mango seed kernel extract and oil were investigated. The results indicated that combination of both mango seed kernel extract and oil had optimum antioxidant potency higher than each one alone. Addition of 400 ppm methanol extract and 5% mango seed kernel oil increased the oxidative stability of sunflower oil incubated at ambient temperature as well as sunflower oil during frying. Moreover, both extract and oil improved the stability and quality characteristics of fresh and stored potato chips. On the other hand, mango seed kernel extract reduced total bacterial count, inhibited coliforms growth, showed remarkable antimicrobial activity against Escherichia coli strain and extended the shelf-life of pasteurized cow milk. These results provide useful information on the utilization of mango seed kernel as natural antioxidant and antimicrobial in foods.

Keywords: Mango seed kernel extract and oil; Sunflower oil; Potato chips; Cow milk; Antioxidant activity; Antimicrobial effect

Nomusa R. Dlamini, John R.N. Taylor, Lloyd W. Rooney, The effect of sorghum type and processing on the antioxidant properties of African sorghum-based foods, Food Chemistry, Volume 105, Issue 4, 2007, Pages 1412-1419, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.05.017.
(http://www.sciencedirect.com/science/article/B6T6R-4NSMMW2-4/2/13cd906dedcdcffe7a94717be2ab3f81)
Abstract:
This work determined the effect of sorghum type and different processing technologies of traditional African sorghum foods on total phenols, tannin content and antioxidant activity. The products were prepared by fermentation, conventional and extrusion cooking of whole and decorticated ground grain. The tannin sorghum types, had higher ABTS and DPPH antioxidant activities, compared to the types without tannins. Antioxidant activity was significantly correlated with total phenols and tannins ($r > 0.95$). Decortication, reduced antioxidant activity of both tannin and non-tannin sorghum by 82-83% due to the removal of the pericarp and the testa, which decreased phenols. Processing, generally decreased antioxidant activity, however, conventionally cooked porridges had higher antioxidant activity than the extrusion cooked products. The retention of antioxidant activity, particularly in fermented and unfermented porridges, means that whole tannin sorghum can be processed into foods with potential health benefits.
Keywords: Sorghum-based foods; Antioxidant activity; Tannins; ABTS; DPPH; Total phenols

C.M. Ajila, K.A. Naidu, S.G. Bhat, U.J.S. Prasada Rao, Bioactive compounds and antioxidant potential of mango peel extract, Food Chemistry, Volume 105, Issue 3, 2007, Pages 982-988, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.04.052.
(http://www.sciencedirect.com/science/article/B6T6R-4NP987D-1/2/b4bcf59659d979769f1ddfbaebfe9204)
Abstract:
Bioactive compounds such as polyphenols, carotenoids and anthocyanins present in fruits and vegetables are receiving increased attention because of their potential antioxidant activity. Consumption of such antioxidants offers health benefits including protection against cardiovascular diseases and cancer. Mango peel is a major byproduct obtained during the processing of mango products such as mango pulp and amchur. In the present study, the antioxidant activity of mango peel extracts was examined. Polyphenol, anthocyanin and carotenoid contents in acetone extract of peels were determined. Ripe peels contained higher amount of anthocyanins and carotenoids compared to raw peels while raw mango peel had high polyphenol content. Antioxidant activity of ripe and raw mango peels extracted in acetone was determined using different antioxidant systems such as reducing power activity, DPPH free radical scavenging activity, iron induced lipid peroxidation of liver microsomes and soybean lipoxygenase inhibition. The IC50 values were found to be in the range of 1.39-5.24 [mu]g of gallic acid equivalents. Thus, the mango peel extract exhibited good antioxidant activity in different systems and thus may be used in nutraceutical and functional foods.
Keywords: Mango; Mango peel; Bioactive compounds; Phenolics; Carotenoids; Anthocyanins; Antioxidant activity

Ryszard Rywotycki, The effect of baking of various kinds of raw meat from different animal species and meat with functional additives on nitrosamine contamination level, Food Chemistry, Volume 101, Issue 2, 2007, Pages 540-548, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.02.012.
(http://www.sciencedirect.com/science/article/B6T6R-4K2SKF7-1/2/b930e8ea7a65dac2e75195a06d3fd1b4)

Abstract:
The studies aimed to determine the occurrence and formation of nitrosamine contamination levels with dimethylnitrosamine (DMNA) and diethylnitrosamine (DENA) in meat of various kinds, species and genders of farm animals slaughtered at meat processing plants all over Poland. The meat after cooling, cutting and jointing was classified, then comminuted and divided into several experimental variants. Moreover, the effect of the most frequent functional additives used in food industry, such as sodium chloride and sodium ascorbate, and baking process upon the level of the meat pollution was researched. Nitrosamine (DMNA and DENA) concentrations were assessed by Varian 3400 gas chromatograph coupled with Finnigan MAT ITD 800 spectrometer. The quantitative and qualitative states of respective nitrosamines were determined by comparing the chromatogram values.
The experiments conducted by the author revealed that sodium chloride or sodium ascorbate added to the meat caused a decrease in nitrosamine contamination level in comparison with meat without the additives. It was also found that under the experimental conditions and for the experimental variants, baking process leads to an increase in the levels of nitrosamine (DMNA and DENA) contamination in comparison with meat free of functional additives as compared to meat containing the functional additives.
Keywords: Dimethylnitrosamine (DMNA); Diethylnitrosamine (DENA); Meat; Functional additives; Baking

Ryan J. Elias, D. Julian McClements, Eric A. Decker, Impact of thermal processing on the antioxidant mechanisms of continuous phase [beta]-lactoglobulin in oil-in-water emulsions, Food Chemistry, Volume 104, Issue 4, 2007, Pages 1402-1409, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.01.072.
(http://www.sciencedirect.com/science/article/B6T6R-4N2D30C-6/2/03e1e4b7db8a8a2830009c4bbaa1a8a6)
Abstract:
The influence of native and thermally (50-95 [degree sign]C) denatured [beta]-lactoglobulin ([beta]-Lg) on the oxidative stability of surfactant-stabilized menhaden oil-in-water emulsions (pH 7.0) was evaluated. [beta]-Lg (500 [mu]g/g oil) heated at 95 [degree sign]C for 30 min provided the best protection against lipid oxidation, inhibiting the formation of lipid hydroperoxides and thiobarbituric acid reactive substances (TBARS) by 87% and 88%, respectively, following 7 days of storage. The possible mechanisms of antioxidant activity of native and heated [beta]-Lg were evaluated by measuring peroxyl radical scavenging and iron chelating capacities of the protein treatments, as well as reactive sulfhydryl concentrations and tryptophan fluorescence (a marker of protein conformation changes). The aforementioned in vitro assays only partially corroborated the results from the oxidizing emulsion system since [beta]-Lg heated at 95 [degree sign]C exhibited the lowest iron chelation capacity and free sulfhydryl concentration, yet displayed the highest peroxyl radical scavenging capacity and inhibition of lipid oxidation in oil-in-water emulsions of all treatments tested. The results of this study demonstrate the feasibility of proteins as a natural class of antioxidants in food emulsions, and further elucidate the possible mechanisms by which proteins inhibit lipid oxidation.
Keywords: Lipid oxidation; Thermal denaturation; [beta]-Lactoglobulin; Food emulsions; Antioxidants

Molay Kumar Roy, Makiko Takenaka, Seiichiro Isobe, Tojiro Tsushida, Antioxidant potential, anti-proliferative activities, and phenolic content in water-soluble fractions of some commonly consumed vegetables: Effects of thermal treatment, Food Chemistry, Volume 103, Issue 1, 2007, Pages 106-114, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.08.002.
(http://www.sciencedirect.com/science/article/B6T6R-4M1TT63-8/2/2f5f663d8ed987126e795534f64f9fa8)

Abstract:
Thermal treatments associated with food processing can alter the phenolic content of vegetables; yet, the biological properties associated with altered phenolic content have not been well delineated. We assessed the effects of various thermal treatments on total phenolic content, antioxidant and anti-proliferative activities of water-soluble fractions from six commonly consumed vegetables. Phenolic content in the water-soluble fraction of the tested vegetables was in the order of spinach > `komatsuna' > `haruna' > `chingensai' > white cabbage > Chinese cabbage. Total antiradical activity against the DPPH radical was in the order of `komatsuna' > spinach > `haruna' > `chingensai' > white cabbage > Chinese cabbage. Antiradical activity against hydroxyl radicals (deoxyribose assay) was highest for spinach and white cabbage. White cabbage extract showed the highest anti-proliferative activity in HL 60 cells. Normal cooking temperatures detrimentally affected phenolic content as well as antiradical and anti-proliferative activities of juice from most of the vegetables tested. However, mild heating of vegetable juices (50 [degree sign]C, 10-30 min) preserved 80-100% of phenolic content, and both antioxidant activity and cell proliferation inhibition activities. The degree of thermal processing affects not only the content of phenolic compounds in vegetables but also beneficial biological effects associated with these compounds.
Keywords: Green vegetables; Thermal effect; Phenolic content; Antioxidant; Cell proliferation inhibition; HL-60

Jianmei Yu, Mohamed Ahmedna, Ipek Goktepe, Peanut protein concentrate: Production and functional properties as affected by processing, Food Chemistry, Volume 103, Issue 1, 2007, Pages 121-129, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.08.012.
(http://www.sciencedirect.com/science/article/B6T6R-4M2WPBD-1/2/e8f334ffd81bf2be72bba5b044718a06)
Abstract:
Peanut protein concentrate (PPC) was isolated from fermented and unfermented defatted peanut flour by isoelectric precipitation and physical separation procedures. PPC was dried by spray or vacuum drying. PPC powders from each drying technique were evaluated for proximate composition and functional properties (protein solubility, water/oil binding capacity, emulsifying capacity, foaming capacity and viscosity) along with defatted peanut flour and soy protein isolate as references. PPC contained over 85% protein versus 50% protein in the defatted peanut flour used as raw material for PPC production. PPC had a solubility profile similar to that of peanut flour, with minimum solubility observed at pH 3.5-4.5 and maximum solubility at pH 10 and higher. Roasting of peanut reduced all functional properties of defatted peanut flour while fermentation had the reverse effect. The type of drying significantly affected the functional properties of PPC. Spray dried PPCs exhibited better functional properties, particularly emulsifying capacity and foaming capacity, than vacuum oven dried PPC. Spray dried PPCs also showed comparable oil binding and foaming capacity to commercially available soy protein isolate (SPC). At equivalent concentrations and room temperature, PPC suspension exhibited lower viscosity than soy protein isolate (SPI) suspensions. However, upon heating to 90 [degree sign]C for 30 min, the viscosity of PPC suspension increased sharply. Results obtained from this study suggest that the PPC could be used in food formulations requiring high emulsifying capacity, but would not be suitable for applications requiring high water retention and foaming capacity. PPC could be a good source of protein fortification for a variety of food products for protein deficient consumers in developing countries as well as a functional ingredient for the peanut industry. The production of PPC could also add value to defatted peanut flour, a low value by-product of peanut oil production.
Keywords: Defatted peanut flour; Peanut protein concentrate; Functional properties; Drying methods

Hui-Hsin Chang, Po-Jung Chien, Man-Hua Tong, Fuu Sheu, Mushroom immunomodulatory proteins possess potential thermal/freezing resistance, acid/alkali tolerance and dehydration

stability, Food Chemistry, Volume 105, Issue 2, 2007, Pages 597-605, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.04.048.
(http://www.sciencedirect.com/science/article/B6T6R-4NNYJFB-1/2/cd8421629d5c368c19a043a841ef99b3)
Abstract:
Mushroom lectins have been reported as immunomodulatory proteins. To evaluate their functionalities, as affected by various industrial procedures, two mushroom proteins, including Agaricus bisporus lectin (ABL) and the immunomodulatory protein of Auricularia polytricha (APP), were treated by various methods, mimicking food processing procedures, in prior-to-cell experiments, and their macrophage-activating functionalities were determined in the induction of tumor necrosis factor-alpha (TNF-[alpha]) and nitric oxide (NO) productions by RAW264.7 cells in vitro. The remaining activities of ABL and APP, after autoclave treatment (121 [degree sign]C, 15 min), were observed to be 77.4% and 80.7%, respectively, in their stimulations of TNF-[alpha] production by cells. Boiling (100 [degree sign]C, 30 min) and freezing (-80 [degree sign]C, 24 h) treatments did not reduce their effects on TNF-[alpha] and NO secretions, while treating with pH 2 and pH 13 buffers only resulted in insignificant decrease of the ABL- and APP-induced TNF-[alpha] and NO production. Moreover, ABL and APP also withstood vacuum dehydration with 96.5% and 84.6% of activities being retained, respectively, in their stimulations of TNF-[alpha] production. These findings revealed that ABL and APP had thermal/freezing-resistant, acid/alkali tolerance and dehydration stable properties, and that they were potential candidates, as stable immune stimulants, for health food and pharmaceutical utilization.
Keywords: Mushroom immunomodulatory protein; Agaricus bisporus; Auricularia polytricha; Stability

Xiangzhen Kong, Huiming Zhou, Haifeng Qian, Enzymatic preparation and functional properties of wheat gluten hydrolysates, Food Chemistry, Volume 101, Issue 2, 2007, Pages 615-620, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.01.057.
(http://www.sciencedirect.com/science/article/B6T6R-4JN2KMR-1/2/22e4925c1e40d9db35ac96155b103db8)
Abstract:
The water-insolublity of wheat gluten is one of the major limitations for its more extensive use in food processing. Wheat gluten was enzymatically hydrolyzed by several commercially available proteases (Pancreatin Trypsin 6.0S, Porcine pepsin, Pancreatin and Alcalase 2.4L) with protein recovery varying from 42.5 +/- 0.7% to 81.3 +/- 0.1%. The hydrolytic efficiency of these proteases on wheat gluten was also compared. Alcalase served best for the preparation of wheat gluten hydrolysates (WGHs). Thus, Alcalase-assisted hydrolysates of wheat gluten (AWGHs) with different degrees of hydrolysis (DH 5.0, 10.0 and 15.0%) were further assessed for their functionalities. All the AWGHs had excellent solubility (>60%) over a pH range of 2-12. The emulsifying and foaming properties of AWGH with relatively low DH (5.0%) were remarkably higher compared to the original gluten. However, extensive hydrolysis of gluten resulted in remarkable reduction in emulsifying and foaming properties.
Keywords: Wheat gluten; Enzymatic hydrolysis; Alcalase; Functional property

Marica Rakin, Maja Vukasinovic, Slavica Siler-Marinkovic, Milan Maksimovic, Contribution of lactic acid fermentation to improved nutritive quality vegetable juices enriched with brewer's yeast autolysate, Food Chemistry, Volume 100, Issue 2, 2007, Pages 599-602, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.09.077.
(http://www.sciencedirect.com/science/article/B6T6R-4HR72NX-7/2/4d5112d91af1c0014ea9b5febbe2032f)
Abstract:

Vegetables are rich sources of the biologically active compounds which have beneficial effects in prevention of some diseases and certain types of cancer. From the point of view of protection and health, the objective of this paper was to optimize food content in order to obtain a functional food. In order to improve the nutritive and protective properties of the product, the beetroot and carrot juices enriched with brewer's yeast autolysate were subjected to lactic-acid fermentation with Lactobacillus acidophilus NCDO1748.
Chemical compositions of produced fermented bioproducts showed that fermented carrot juice with brewer's yeast autolysate had higher contents of some minerals (Ca, P, Fe) and [beta]-carotene than had beetroot juice with brewer's yeast autolysate. Higher mineral content in the carrot juice better affected production of lactic acid in that sample. Fermented beetroot juice with brewer's yeast autolysate had higher contents of betanin and vitamin C, which were in accordance with the contents of these components in raw beetroot that did not significantly vary during the processing of the material (pasteurization, fermentation). Thus the fermented bioproduct 3, which is a mixture of beetroot and carrot juices with brewer's yeast autolysate, represents the product with optimum proportions of pigments, vitamins and minerals.
Keywords: Fermented juice; Beetroot; Carrot; Brewer's yeast autolysate; Chemical composition

Kavita M. Tarade, Rekha S. Singhal, Radha V. Jayram, Aniruddha B. Pandit, Kinetics of degradation of ODAP in Lathyrus sativus L. flour during food processing, Food Chemistry, Volume 104, Issue 2, 2007, Pages 643-649, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.12.018.
(http://www.sciencedirect.com/science/article/B6T6R-4MNR0NC-1/2/4f6292ec9d23385c191707e0d1ded93e)
Abstract:
A nonprotein neurotoxic amino acid, [beta]-N-oxalyl-l-2,3-diaminopropionic acid (ODAP), found in Lathyrus sativus (grass pea or chickling vetch) seeds is known to be relatively heat stable. The present study aims at development of a kinetic model for degradation of ODAP in Lathyrus sativus subjected to a defined set of processing conditions. This study was carried out at pH 4.0 and 9.2. Isothermal condition experiments were carried out over a temperature range of 60-120 [degree sign]C. For nonisothermal conditions, three different cooking methods viz., - open pan, pressure cooking and cooking in recently developed and patented fuel efficient `EcoCooker' were used. The degradation of ODAP was adequately modeled by Arrhenius type of equation. A mathematical model based on the time temperature data of the nonisothermal heat process and isothermal kinetic rate parameters has been developed to predict the degradation of ODAP in any nonisothermal heating process of known time temperature profiles.
Keywords: ODAP degradation; Kinetics; Lathyrus sativus; Fuel-efficient cookers

Xiangzhen Kong, Huiming Zhou, Haifeng Qian, Enzymatic hydrolysis of wheat gluten by proteases and properties of the resulting hydrolysates, Food Chemistry, Volume 102, Issue 3, 2007, Pages 759-763, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.06.062.
(http://www.sciencedirect.com/science/article/B6T6R-4M0BHRV-1/2/9298516d04b639c95ade26e0aab13b34)
Abstract:
The insolubility of gluten in aqueous solutions is one of the major limitations for its more extensive use in food processing. Wheat gluten was enzymatically hydrolyzed by several commercially available proteases (Alcalase 2.4L, PTN 6.0S, Pepsin, Pancreatin, Neutrase and Protamex(TM)) with protein recovery of 81.3%, 42.5%, 53.3%, 61.6%, 46.3% and 43.8%, respectively. The hydrolytic efficiency of these proteases on wheat gluten was also compared. Alcalase served best for the preparation of wheat gluten hydrolysates with the maximum degree of hydrolysis (DH) 15.8%. Subsequently, the solubility of wheat gluten hydrolysates (WGHs) obtained with those enzymes was comparably evaluated. The products had excellent solubility (>60%) over a pH range of 2-12. The molecular weight distribution of WGHs was further determined by SDS-PAGE

and size exclusion chromatography on Sephadex G-15. The results showed that with the increasing of DH values, there occurred a large amount of smaller polypeptides.
Keywords: Wheat gluten; Enzymatic hydrolysis; Solubility; SDS-PAGE

Pedro Elez-Martinez, Olga Martin-Belloso, Effects of high intensity pulsed electric field processing conditions on vitamin C and antioxidant capacity of orange juice and gazpacho, a cold vegetable soup, Food Chemistry, Volume 102, Issue 1, 2007, Pages 201-209, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.04.048.
(http://www.sciencedirect.com/science/article/B6T6R-4KBVX22-1/2/aa0f2fe16ec3aaf3a18c0dde912992da)
Abstract:
Orange juice and gazpacho, a cold vegetable soup, were submitted to high intensity pulsed electric fields (HIPEF). The effects of electric field strength, treatment time, pulse frequency, width and polarity, as process parameters, on vitamin C retention and antioxidant capacity of both products were evaluated and compared to those in a heat pasteurization. Vitamin C was determined by HPLC and antioxidant capacity through the inhibition of the DPPH (1,1-diphenyl-2-picrylhydrazyl) radical. Orange juice and gazpacho retained a 87.5-98.2% and 84.3-97.1% of vitamin C, respectively, after HIPEF treatments. Pulses applied in bipolar mode, as well as a lower electric field strength, treatment time, pulse frequency and width, led to higher levels of vitamin C retention ($p < 0.05$). HIPEF-treated orange juice and gazpacho always showed a vitamin C retention higher than that of the heat-pasteurized products. There were no differences ($p < 0.05$) in antioxidant capacity between HIPEF-treated and untreated products, whereas heat-treated foods showed lower values of antioxidant capacity.
Keywords: High intensity pulsed electric fields; Orange juice; Gazpacho; Vitamin C; Antioxidant capacity

Tonje Holte Stea, Madelene Johansson, Margaretha Jagerstad, Wenche Frolich, Retention of folates in cooked, stored and reheated peas, broccoli and potatoes for use in modern large-scale service systems, Food Chemistry, Volume 101, Issue 3, 2007, Pages 1095-1107, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.03.009.
(http://www.sciencedirect.com/science/article/B6T6R-4JS23CH-2/2/f69dc04a798de3c839d9fa721ffd9dee)
Abstract:
This study aimed to evaluate retention of folate in vegetables caused by different processes used in modern large-scale service systems and the food industry. The concentration of folates present in raw samples of peas, broccoli and potatoes was measured during different cooking methods, warm and cold holding and reheating. The main folate forms in vegetables, tetrahydrofolates and 5-methyltetrahydrofolates, were analysed using a validated high-performance liquid chromatography (HPLC) method.
This study shows the following decreasing order in folate retention, on DM basis, compared to raw potatoes during heat-processing: sous-vide (103%), boiling (72-59% (unpeeled and peeled)) and oven-baking (63%) and compared to raw green peas during heat processing: boiling (77%), microwaving (75%), steam boiling (73%) and blanching (71%). However, only blanching of peas, boiling of potatoes and oven-baking of unpeeled potatoes caused significant reduction. Storage at various temperatures and length of times followed by reheating caused no further significant losses of total folate.
Keywords: Folate; Vegetables; Food processing; Food analysis; High-performance liquid chromatography; Large-scale service systems

Saeedeh Arabshahi-D, D. Vishalakshi Devi, Asna Urooj, Evaluation of antioxidant activity of some plant extracts and their heat, pH and storage stability, Food Chemistry, Volume 100, Issue 3, 2007, Pages 1100-1105, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.11.014.
(http://www.sciencedirect.com/science/article/B6T6R-4HYN0BY-5/2/d315a7e878f569c3dedbc3bd48d66265)
Abstract:
In the present study, three plant foods, namely, drumstick leaves (Moringa oleifera), mint leaves (Mentha spicata) and carrot tuber (Daucus carota) were extracted with ethanol and analyzed for their antioxidant activity. The antioxidant activity of extracts was evaluated according to the amount of malonaldehyde (MDA) formed by the FeSO4-induced oxidation of linoleic acid and a high PUFA oil (sunflower oil) at 37 [degree sign]C in Trizma-buffer (pH 7.4). At a concentration of 1.5 mg/ml of linoleic acid ,the extracts from drumstick and carrot had a higher antioxidant activity (83% and 80%) than [alpha]-tocopherol (72%). In sunflower oil, the extracts from drumstick leaves and mint leaves were found to exhibit a similar activity(46% and 44%). The extract from drumstick exhibited the highest activity in both lipid systems. In addition, the stability of extracts to pH (4 and 9) and temperature (100 [degree sign]C, 15 min) was investigated. The antioxidant activity of the extracts from mint leaves and carrot was higher at pH 9 than pH 4, while that of drumstick extract remained the same under both pH conditions. The extract from carrot was more heat-stable than other extracts. The three extracts stored in the dark at 5 and 25 [degree sign]C after a 15 day period did not show any significant change (p [less-than-or-equals, slant] 0.05) in their antioxidant activity. These data indicate that selected plant extracts are potential sources of dietary antioxidants.
Keywords: Antioxidant activity; Plant extract; Processing; Stability

Sivakumar Raghavan, Mark P. Richards, Comparison of solvent and microwave extracts of cranberry press cake on the inhibition of lipid oxidation in mechanically separated turkey, Food Chemistry, Volume 102, Issue 3, 2007, Pages 818-826, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.04.049.
(http://www.sciencedirect.com/science/article/B6T6R-4KNMB9X-3/2/c9d2eeb7cfd14d5ec965dfbd028f735a)
Abstract:
Cranberry press cake, an under utilized by-product of the cranberry processing industry is a potential source of food antioxidants. The objective of this research were (1) to prepare extracts from cranberry press cake using solvent extraction (SE) and microwave assisted solvent extraction (MASE), and (2) to test the ability of these extracts to inhibit lipid oxidation in mechanically separated turkey (MST). Water, ethanol and acetone were used as extraction solvents. Heating press cake prior to extraction with 70% ethanol increased antioxidant efficacy compared to extracting unheated press cake. Water extracts were least effective in inhibiting lipid oxidation. The most effective extracts were obtained by SE with 100% acetone or MASE with 100% ethanol. A poor correlation of 0.69 was obtained between the total phenols in the extracts and their ability to inhibit thiobarbituric acid reactive substances (TBARS) formation in MST. The correlation coefficient between the amount of quercetin in the extracts and the number of days of TBARS inhibition in MST was 0.87. This indicates that although quercetin may be good inhibitor of lipid oxidation, polyphenols other than quercetin are likely have a role in the inhibition of TBARS in MST. For a similar yield of the extracts, MASE extract using 100% ethanol was a better inhibitor than 100% ethanol SE extract of lipid oxidation in MST. In terms of choice of solvent, based on their flammability and toxicity, MASE with 100% ethanol would be a more likely a choice over SE with 100% acetone, for inhibiting oxidation in MST.
Keywords: Cranberry press cake; Solvent extraction; Microwave assisted extraction; Antioxidative behavior; Mechanically separated turkey

Robert Yawadio, Shinji Tanimori, Naofumi Morita, Identification of phenolic compounds isolated from pigmented rices and their aldose reductase inhibitory activities, Food Chemistry, Volume 101, Issue 4, 2007, Pages 1616-1625, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.04.016.
(http://www.sciencedirect.com/science/article/B6T6R-4JV448W-7/2/7634d5b4a21f17107a64f41fe2037196)
Abstract:
Two anthocyanins (cyanidin-3-O-[beta]-glucoside and peonidin-3-O-[beta]-glucoside) and other phenolic (ferulic acid) were, respectively isolated from black and pigmented brown rices (Oryza sativa L. japonica) and their complete structures were determined by spectroscopic analyses (H NMR, C NMR and MALDI MASS). The HPLC profile of anthocyanins extracted from black rice showed cyanidin-3-O-[beta]-glucoside as the first peak (85%) and peonidin 3-O-[beta]-d-glucoside as the second (15%), while that of pigmented brown rice showed ferulic acid as the first peak (85.7%) and tocols as the second (14.3%). Several tocols were isolated and identified from the unsaponifiable fractions of both rices having some difference on their structures and amounts. The aldose reductase inhibitory activity of isolated compounds was in the following decreasing order: cyanidin-3-glucoside > quercetin > ferulic acid > peonidin-3-glucoside > tocopherol.
All isolated compounds showed significant inhibitory activity against aldose reductase suggesting that both pigmented rices might contribute significantly in combating diabetic complications as health-promoting food ingredients in food processing.
Keywords: Aldose reductase inhibitory activity; Phenolics; Black rice; Pigmented brown rice; Health-promoting food ingredients

Yemisi A. Adebowale, Isaac A. Adeyemi, Aladesanmi A. Oshodi, Keshavan Niranjan, Isolation, fractionation and characterisation of proteins from Mucuna bean, Food Chemistry, Volume 104, Issue 1, 2007, Pages 287-299, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.11.050.
(http://www.sciencedirect.com/science/article/B6T6R-4MYFG29-1/2/72fbd1638d9cf8af2f2926cac1b3004e)
Abstract:
The chemical composition and fractional distribution of protein isolates prepared from species of Mucuna bean were studied. Using six different extraction media, the yield of protein based on the Kjeldahl procedure varied from 8% to 34%, and the protein content varied from 75% to 95%. When the yields were high, the colour of the isolates generally tended to be dark and unsatisfactory. Hence, the use of chemical treatments and high pressure processing were explored.
The solubility maxima for the protein isolates in water were found to occur at pH values of 2.0 and 11.0, while the pH corresponding to minimum solubility (i.e. isoelectric region) occurred at pH values of 4.0 and 5.0. The total essential amino acid in the isolates ranged from 495 to 557 mg g-1 protein, which compares favourably with the recommended level for pre-school and school children. Methionine and cysteine were the limiting amino acids. A key nutritional attribute of the protein isolates was its high lysine content. The isolate can therefore complement cereal-based foods which are deficient in lysine.
The proteins mainly consisted of albumins, glutelins and globulins. Prolamins were only present in trace concentration (<0.3%). Gel filtration chromatograms of the isolates indicated the presence of major protein fractions with molecular weights of 40 and 15 kDa, while gel electrophoresis (SDS-PAGE) indicated a major broad zone with molecular weights of 36 +/- 7 and 17.3 +/- 3 kDa.
Keywords: Mucuna species; Protein isolate; Isoelectric precipitation; Protein fractions

H.B. Sowbhagya, P. Florence Suma, S. Mahadevamma, R.N. Tharanathan, Spent residue from cumin - a potential source of dietary fiber, Food Chemistry, Volume 104, Issue 3, 2007, Pages 1220-1225, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.01.066.
(http://www.sciencedirect.com/science/article/B6T6R-4N1T1Y6-1/2/00ccfdc546f83c6b444410d547955486)

Abstract:
Cumin has total dietary fiber content (TDF) of 59.0%, insoluble dietary fiber (IDF) of 48.5%, and soluble dietary fiber (SDF) of 10.5%, while the spent residue from cumin (after oil and oleoresin extraction) was found to contain 62.1% TDF, 51.7% IDF and 10.4% SDF. The spent residue also contained 7.7% starch and 5% bound fat. Particle size analysis showed a direct effect on the hydration properties of the fiber. The spent residue exhibited 3.3 g/g water holding capacity, 4.0 g/g water retention capacity and 4.47 ml/g swelling capacity. Scanning electron microscopy revealed spherical starch granules embedded within cell wall material, which upon differential sedimentation gave differently sized starch granules (5.8 [mu]m). Upon defatting the spent residue showed typically a `honey comb' structure, almost devoid of starch granules. Thus, the spent residue from cumin, not having much commercial value at present, can be a rich source of useful dietary fiber and can find food applications. It can be an effective way of utilizing industrial waste from the point of view of environmental pollution from the residues of spice processing industries.
Keywords: Dietary fiber; Hydration properties; Soluble fiber; Insoluble fiber; Cumin; Cumin spent residue

Hubert Chassaigne, Marcel Brohee, Jorgen V. Norgaard, Arjon J. van Hengel, Investigation on sequential extraction of peanut allergens for subsequent analysis by ELISA and 2D gel electrophoresis, Food Chemistry, Volume 105, Issue 4, 2007, Pages 1671-1681, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.04.055.
(http://www.sciencedirect.com/science/article/B6T6R-4NS2GP8-1/2/cc93715ebc85bfb49349d7f1d905bb73)
Abstract:
A two-step sequential extraction method of peanut proteins was proposed with the aim to investigate the protein composition and allergen content of peanut samples. The extraction procedure reported is fully compatible with subsequent analysis by enzyme-linked immunosorbent assays (ELISA) as well as 2D gel electrophoresis (2D PAGE). This sequential extraction method was used to study three different peanut varieties and three different types of food processing. Peanuts were analysed for total protein content and the extraction efficiency of raw and processed peanuts was determined. The total protein content of the three peanut varieties was found to be comparable, but their extraction efficiency varies. The peanut extracts were characterised by employing three different ELISA test kits specific to either the allergens Ara h 1 or Ara h 2, or to soluble peanut proteins. The content of both Ara h 1 and Ara h 2 differed in the raw peanut extracts of the three varieties. However, thermal processing resulted in much larger changes in detectability. Blanching significantly increases the detectability of Ara h 2, whereas Ara h 1 detection remains almost unchanged. After roasting a clear decrease of detectability was observed for both Ara h 1 and Ara h 2, although the effect is more severe for Ara h 1. 2D PAGE was employed to compare the protein profiles and abundances of peanut extracts. Statistically relevant differences were observed for the two different protein fractions obtained by using the described method, showing the relevance of this two-step sequential extraction method.
Keywords: Food allergy; Peanut proteins; Sequential extraction; Sample preparation; Enzyme-linked immunosorbent assay (ELISA); Two-dimensional gel electrophoresis (2D PAGE)

Donkeun Park, Youling L. Xiong, Oxidative modification of amino acids in porcine myofibrillar protein isolates exposed to three oxidizing systems, Food Chemistry, Volume 103, Issue 2, 2007, Pages 607-616, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.09.004.
(http://www.sciencedirect.com/science/article/B6T6R-4M4KR75-3/2/804cf7c3ade4dda2092aa4e418c3e102)
Abstract:
Susceptibility of amino acids in myofibrillar protein isolate (MPI) exposed to three oxidizing matrixes commonly encountered in muscle foods was compared. MPI suspensions (20 mg

protein/mL) in 15 mM piperazine-N,N bis(2-ethane sulphonic acid) buffer (pH 6.0) were oxidized with an iron-catalyzed oxidizing system (IOS, 0.01 mM FeCl3, 0.1 mM ascorbic acid, 0.0-10.0 mM H2O2), a lipid-oxidizing system (LOS, 0.0-10.0 mM linoleic acid, 3750 units of lipoxidase/mL), or a metmyoglobin (MetMb) oxidizing system (MOS, 0.0-0.5 mM H2O2/MetMb) for 24 h at 4 [degree sign]C. Changes were quantitatively analyzed by determining amino acids on a reverse-phase liquid chromatographic (LC) system. In IOS, the amount of cysteine, methionine and tyrosine decreased ($P < 0.05$) with increasing [H2O2]. In LOS, only cysteine and methionine were lowered at increasing linoleic acid concentrations. In MOS, the quantity of alanine, cysteine, glycine, histidine, leucine and lysine, as well as the total amount of amino acids were significantly reduced at high concentrations of MetMb/H2O2. The results suggest that under typical meat processing conditions, iron- and metmyoglobin-catalyzed reactions play a major role in the oxidation of amino acids in muscle proteins.
Keywords: Protein oxidation; Hydroxyl radicals; Metmyoglobin; Amino acids

Marshall A. Azeke, Barbara Fretzdorff, Hans Buening-Pfaue, Thomas Betsche, Comparative effect of boiling and solid substrate fermentation using the tempeh fungus (Rhizopus oligosporus) on the flatulence potential of African yambean (Sphenostylis stenocarpa L.) seeds, Food Chemistry, Volume 103, Issue 4, 2007, Pages 1420-1425, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.10.058.
(http://www.sciencedirect.com/science/article/B6T6R-4MH8BPV-4/2/00ad937251bd6d6da94918f815ef7465)
Abstract:
The tropical African yambean (AYB, Sphenostylis stenocarpa L.) is a protein-rich underutilized African legume. The presence of the flatulence- and diarrhoea-causing raffinose family oligosaccharides (RFO: raffinose, stachyose and verbascose) or [alpha]-galactosides has limited the food use of African yambean seeds. To reduce this limitation, non-traditional processing methods are required. Seeds of three varieties were (i) examined for the flatulence- and diarrhoea-causing RFO and (ii) fermented with Rhizopus oligosporus for tempeh production. The traditional tempeh production process involved dehulling, soaking in water for 24 h, boiling in water for 30 min, inoculation and fermentation. In addition, the traditional tempeh procedure was modified by using 1% citric acid solution instead of water for soaking and cooking. Comparisons with traditionally cooked beans, which involved boiling in water for 4 h, were made. Boiling seeds for 4 h resulted in 8-30% reduction of total [alpha]-galactosides in the three varieties, while the traditional tempeh procedure resulted in an almost complete loss (98%) of the same ($P < 0.05$). The modified procedure resulted in a bacteria-free tempeh but [alpha]-galactoside reduction was 22-39%. Both tempeh production processes were clearly more effective than was traditional cooking in reducing the flatulence potential of the AYB seeds.
Keywords: Sphenostylis stenocarpa; Rhizopus oligosporus; Tempeh; [alpha]-Galactosides; Oligosaccharides; Underutilized crops

Zia-ur-Rehman, Domestic processing effects on available carbohydrate content and starch digestibility of black grams (Vigna mungo) and chick peas (Cicer arietium), Food Chemistry, Volume 100, Issue 2, 2007, Pages 764-767, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.10.041.
(http://www.sciencedirect.com/science/article/B6T6R-4JG5FPR-1/2/87897cd4a1445c22e2075a7df3ddf213)
Abstract:
Domestic processing effects on available carbohydrate contents and starch digestibility of black grams and chick peas were investigated. The food legumes were soaked in tap water and alkaline solution of sodium bicarbonate at 30 and 100 [degree sign]C for 1-2 h before cooking under pressure. Total soluble sugars, reducing sugars and starch contents of black grams and chick

peas were 9.64% and 9.83%, 0.78% and 0.83%, 43.0% and 44.3%, respectively. All these available carbohydrate contents of black grams and chick peas were reduced to various extents as a result of soaking and cooking. At 30 [degree sign]C, 4.46% of total soluble sugars, 3.84% of reducing sugars and 6.86% of starch contents were reduced on soaking the black grams in tap water for 1 h. Available carbohydrate contents were further reduced when soaking time and temperature of the food legumes was increased before cooking. About 3.43-25.0% of total soluble sugars and 4.26-22.7% of starch contents were lost on soaking black grams and chick peas in tap water and sodium bicarbonate solution. Maximum amounts of total soluble sugars (28.5-59.6%) and starch contents (29.9-67.4%) were lost on cooking the water- and alkali-soaked food legumes. However, these losses were comparatively less with the water soaking process. Besides these losses, starch digestibilities of black grams and chick peas were markedly improved as a result of cooking. However, no appreciable improvement in the starch digestibility was observed after soaking these food legumes in water or alkaline solution.
Keywords: Black grams; Chick peas; Soaking; Cooking; Available carbohydrates; Starch digestibility

Li-jun Wang, Li-jun Yin, Dong Li, Lei Zou, Masayoshi Saito, Eizo Tatsumi, Li-te Li, Influences of processing and NaCl supplementation on isoflavone contents and composition during douchi manufacturing, Food Chemistry, Volume 101, Issue 3, 2007, Pages 1247-1253, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.03.029.
(http://www.sciencedirect.com/science/article/B6T6R-4JHV0DX-7/2/f4be84ac5bca8f8c5ae7a3c4f30541b8)
Abstract:
Douchi is popular in China as a fermented soybean food. The effects of NaCl on the isoflavone contents and composition during processing of douchi, as well as the [beta]-glucosidase activity was investigated. The results indicate that 61% of the isoflavones in raw soybeans were lost when NaCl content was 10%, which is mainly attributed to pre-fermentation (43%) and post-fermentation (18%) during douchi processing. While a pre-treatment did not generate major differences in total isoflavone content during douchi processing, isoflavone composition was altered. The levels of aglycones increased, while the corresponding levels of [beta]-glucosides, malonylglucoside and acetylglucoside decreased. Further, isoflavones in the form of aglycones exceeded 90% of total content following post-fermentation. Finally, changes in isoflavone isomer distribution were found to be related to [beta]-glucosidase activity during fermentation, which was affected by NaCl supplementation.
Keywords: Douchi; Isoflavone; [beta]-Glucosidase; NaCl

Yasemin Sahan, Fikri Basoglu, Seref Gucer, ICP-MS analysis of a series of metals (Namely: Mg, Cr, Co, Ni, Fe, Cu, Zn, Sn, Cd and Pb) in black and green olive samples from Bursa, Turkey, Food Chemistry, Volume 105, Issue 1, 2007, Pages 395-399, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.12.026.
(http://www.sciencedirect.com/science/article/B6T6R-4MP0013-3/2/c5a4eca4baf5370147088a675ae6240e)
Abstract:
Ninety-two black and green table olive samples from the Bursa, Turkey were analyzed. The olives were sampled from 56 brands, four processing methods and three packing types. The concentration of Mg, Cr, Co, Ni, Fe, Cu, Zn, Sn, Cd and Pb were measured by inductively coupled plasma mass spectrometry (ICP-MS). While the most concentrated element was Mg (125.11 +/- 5.02), Co (0.09 +/- 0.01) had the lowest concentration in tested olive samples. The levels of the ten metals studied are within safe limits. The data here obtained will be valuable in complementing available food composition data, and estimating dietary intakes of heavy metals in Turkey. The

metals Mg, Fe, Zn, Sn and Pb presented significant differences ($p < 0.05$) in content between two types, hence processing method, brand and packing material must influence their content.
Keywords: Olive; ICP-MS; Metals

Mohana Kumari, Asna Urooj, N. Narayan Prasad, Effect of storage on resistant starch and amylose content of cereal-pulse based ready-to-eat commercial products, Food Chemistry, Volume 102, Issue 4, 2007, Pages 1425-1430, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.10.022.
(http://www.sciencedirect.com/science/article/B6T6R-4MD95BV-B/2/cb9981e9afc9241fbadf0c141004e5fa)
Abstract:
A wide range of ready-to-eat (RTE) foods, with varied shelf life are commercially available to meet the increasing demand for convenience foods, both by the Armed Forces and the public at large. The study evaluated the effect of storage on the resistant starch (RS) and amylose content of selected ready-to-eat (RTE) cereal-pulse based processed foods viz., pongal, khara bhath, dal fry, bisibele bhath, rajmah and kesari bhath, developed by Defence Food Research Laboratory, Mysore. RS was quantified directly in the residues obtained after removing digested starch in simulated physiological conditions. Nutrient composition and carbohydrate profile of the foods were also analyzed. The carbohydrate profile indicated low amounts of sugars, except in case of kesari bhath. The total starch content ranged from 14.5 to 24 g% while amylose ranged from 1.2 to 7.2 g%, respectively. The total and resistant starch in the RTE foods varied depending on the ingredients used and type of processing. Foods containing higher amylose content were found to have maximum increases in RS content after storage. Storage at ambient conditions resulted in significant increases ($p < 0.05$) in RS and TS content of RTE foods. The findings reveal that the RTE foods studied hitherto contained appreciable quantities of RS, which further increased on storage.
Keywords: Processed foods; Resistant starch; Amylose; Storage

Cheong Tae Kim, Eun-Sun Hwang, Hyong Joo Lee, An improved LC-MS/MS method for the quantitation of acrylamide in processed foods, Food Chemistry, Volume 101, Issue 1, 2007, Pages 401-409, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.10.025.
(http://www.sciencedirect.com/science/article/B6T6R-4HRDYC8-1/2/9973f8fa2307509b2eb22ae312d9c544)
Abstract:
An improved liquid chromatography-tandem mass spectrometry (LC-MS/MS) method was developed for the determination of acrylamide in processed foods. The homogenized samples, spiked with 13C3-acrylamide as an internal standard, were extracted with water and centrifuged. D5-3-chloropropanediol as a recovery standard was added to 1-ml aliquots, and the sample was purified with a C18-cartridge column. The extract was directly analyzed using LC-MS/MS without derivatization. The ion transitions of 72-55 m/z (acrylamide), 75-58 m/z (13C3-acrylamide), and 116-98 m/z (d5-3-chloropropanediol) were found to be the most reliable for the identification and quantification of acrylamide in multiple reaction monitoring. The limit of quantification for acrylamide, defined as a signal-to-noise ratio of 10:1, was 2 [mu]g/kg. The use of d5-3-chloropropanediol minimized the effects of variation in the sample matrixes and increased the quality of analysis. This method could be applied to the quantification of acrylamide in processed foods.
Keywords: Acrylamide; 13C3-Acrylamide; d5-3-Chloropropanediol; LC-MS/MS; Food processing

Constantinos G. Zarkadas, Christine Gagnon, Stephen Gleddie, Shahrokh Khanizadeh, Elroy R. Cober, Ron J.D. Guillemette, Assessment of the protein quality of fourteen soybean [Glycine max (L.) Merr.] cultivars using amino acid analysis and two-dimensional electrophoresis, Food

Research International, Volume 40, Issue 1, January 2007, Pages 129-146, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.08.006.
(http://www.sciencedirect.com/science/article/B6T6V-4M64545-3/2/870448025b514947ce785dcc033e1cd3)
Abstract:
The protein quality of commercial soybeans varieties can be determined from their total protein content, their amino acid composition and from the ratio of glycinin to [beta]-conglycinin, the major seed storage protein components. In this study 14 commercial soybean cultivars were assessed. There were significant differences in storage protein composition ($P < 0.05$) and in their valine, proline and phenylalanine contents ($P < 0.01$ to $P < 0.001$). Mean protein values among these varieties ranged from 29.8% to 36.1%. The total amino acid nitrogen (AAN) ranged from 89.6 to 95.1 g AA/16 g of nitrogen, corresponding to nitrogen values from 16.5 to 17.9 g AAN/100 g protein. All varieties contained a good balance of essential amino acids (EAA9), limited only in methionine. Two-dimensional gel electrophoretic (2-DE) separations, led to the establishment of high-resolution proteome reference maps, enabling polypeptide chain identification and calculation of the ratio of the constituent glycinin and [beta]-conglycinin storage proteins of soybean. This method enables the assessment of the genetic variability of the soybean cultivars, which can then be correlated with their protein quality and food processing properties. These three methods can be used as very effective tools for assisting plant breeders in their selection of high quality soybean varieties.
Keywords: Soybean proteins; Amino acid composition; Amino acid score; Protein quality; Soybean proteome; Glycinin/[beta]-conglycinin ratio

R. El Ramy, M. Ould Elhkim, S. Lezmi, J.M. Poul, Evaluation of the genotoxic potential of 3-monochloropropane-1,2-diol (3-MCPD) and its metabolites, glycidol and [beta]-chlorolactic acid, using the single cell gel/comet assay, Food and Chemical Toxicology, Volume 45, Issue 1, January 2007, Pages 41-48, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.07.014.
(http://www.sciencedirect.com/science/article/B6T6P-4PNJ1NF-6/2/74099c0f63df6cc0fe542d2cc3b0f313)
Abstract:
3-Monochloropropane-1,2-diol (3-MCPD) is a member of a group of chemicals known as chloropropanols. It is found in many foods and food ingredients as a result of food processing. 3-MCPD is regarded as a rat carcinogen known to induce Leydig-cell and mammary gland tumours in males and kidney tumours in both genders. The aim of our study was to clarify the possible involvement of genotoxic mechanisms in 3-MCPD induced carcinogenicity at the target organ level. For that purpose, we evaluated DNA damages in selected target (kidneys and testes) and non-target (blood leukocytes, liver and bone marrow) male rat organs by the in vivo alkaline single cell gel electrophoresis (comet) assay, 3 and 24 h after 3-MCPD oral administration to Sprague-Dawley and Fisher 344 adult rats. 3-MCPD may be metabolised to a genotoxic intermediate, glycidol, whereas the predominant urinary metabolite in rats following 3-MCPD administration is [beta]-chlorolactic acid. Therefore, we also studied the DNA damaging effects of 3-MCPD and its metabolites, glycidol and [beta]-chlorolactic acid, in the in vitro comet assay on CHO cells. Our results show the absence of genotoxic potential of 3-MCPD in vivo in the target as well as in the non-target organs. Glycidol, the epoxide metabolite, induced DNA damages in CHO cells. [beta]-Chlorolactic acid, the main metabolite of 3-MCPD in rats, was shown to be devoid of DNA-damaging effects in vitro in mammalian cells.
Keywords: 3-Monochloropropane-1,2-diol; Glycidol; [beta]-Chlorolactic acid; In vivo and in vitro comet assay; Rat; Genotoxicity

Till Beuerle, Claudine Theuring, Nico Klewer, Stefan Schulz, Thomas Hartmann, Absolute configuration of the creatonotines and callimorphines, two classes of arctiid-specific pyrrolizidine

alkaloids, Insect Biochemistry and Molecular Biology, Volume 37, Issue 1, January 2007, Pages 80-89, ISSN 0965-1748, DOI: 10.1016/j.ibmb.2006.10.005.
(http://www.sciencedirect.com/science/article/B6T79-4M8740F-1/2/989f50d1680172c3c804687b5e402615)
Abstract:
Arctiids which as larvae sequester pyrrolizidine alkaloids (PAs) from their food plants are known to synthesize insect-specific PAs by esterifying necine bases derived from plant PAs with necic acids of insect origin. There are two classes of insect PAs, the creatonotines and the callimorphines. The creatonotines contain as necic acids either 2-hydroxy-3-methylbutyric acid (creatonotine A) or 2-hydroxy-3-methylpentanoic acid (creatonotine B). The three known callimorphines contain 2-hydroxy-2-methylbutanoic acid whose hydroxyl group can be either free (deacetylcallimorphine) or acetylated (callimorphine) or propionylated (homocallimorphine). Insect PAs are assumed to play an important role in the recycling of plant derived necine bases and the processing by trans-esterification of PA monoesters that cannot be directly transmitted to the insect's pupal and adult life-stages. The absolute configuration of the insect-specific necic acids was elucidated in the context of the suggested role of the insect PAs as insect-made mimics of plant monoester PAs of the lycopsamine type. For this purpose all needed stereoisomers were synthesized and a gas chromatography-mass spectrometry (GC-MS) method was established that allows the enantioselective separation and assignment of the stereochemistry of all insect specific necic acids as their methyl esters. The method could also be applied to the GC-MS analysis of the intact alkaloids which were hydrolyzed during injection and converted into their methyl esters. Analysis of the creatonotines and callimorphines isolated from the polyphagous arctiids Estigmene acrea and Grammia geneura that were fed with pure PAs and defined PA mixtures revealed the following absolute configuration: the callimorphines and creatonotine A were present in 2'R configuration, whereas creatonotine B was found as mixture of (2'R, 3'S)- and (2'S, 3'S)-stereoisomers. The ratio of 2'S to 2'R was extremely variable ranging from 98% S to 94% R. The cause of the lack of stereospecificity is discussed particularly in respect of a possible epimerization of the hydroxyl group at C-2' in analogy to the known epimerization at C-3' of plant acquired PAs of the lycopsamine type.
Keywords: Estigmene acrea; Grammia geneura; Arctiidae; Creatonotine; Callimorphine; Insect alkaloid; Pyrrolizidine alkaloid processing; Enantioselective separation

Megha Gandhi, Michael L. Chikindas, Listeria: A foodborne pathogen that knows how to survive, International Journal of Food Microbiology, Volume 113, Issue 1, 1 January 2007, Pages 1-15, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.07.008.
(http://www.sciencedirect.com/science/article/B6T7K-4M0J49G-2/2/1a91e89a4eb3bbede7f8a91653286f61)
Abstract:
The foodborne pathogen Listeria is the causative agent of listeriosis, a severe disease with high hospitalization and case fatality rates. Listeria monocytogenes can survive and grow over a wide range of environmental conditions such as refrigeration temperatures, low pH and high salt concentration. This allows the pathogen to overcome food preservation and safety barriers, and pose a potential risk to human health. This review focuses on the key issues such as survival of the pathogen in adverse environments, and the important adaptation and survival mechanisms such as biofilm formation, quorum sensing and antimicrobial resistance. Studies on the development of technologies to prevent and control L. monocytogenes contamination in foods and food processing facilities are also discussed.
Keywords: Listeria monocytogenes; Low temperature; Acid stress; Osmotic stress; Biofilm; Quorum sensing; Antimicrobial resistance; Food preservation

Cristiana Garofalo, Carla Vignaroli, Giada Zandri, Lucia Aquilanti, Donatella Bordoni, Andrea Osimani, Francesca Clementi, Francesca Biavasco, Direct detection of antibiotic resistance genes in specimens of chicken and pork meat, International Journal of Food Microbiology, Volume 113, Issue 1, 1 January 2007, Pages 75-83, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.07.015.
(http://www.sciencedirect.com/science/article/B6T7K-4M04HW4-4/2/56521db70b0db06337bf49d739e201c6)
Abstract:
Antibiotic resistance (AR) in bacteria, a major threat to human health, has emerged in the last few decades as a consequence of the selective pressure exerted by the widespread use of antibiotics in medicine, agriculture and veterinary practice and as growth promoters in animal husbandry.
The frequency of 11 genes [tet(M), tet(O), tet(K), erm(A), erm(B), erm(C), vanA, vanB, aac (6')-Ie aph (2'')-Ia, mecA, blaZ] encoding resistance to some antibiotics widely used in clinical practice was analysed in raw pork and chicken meat and in fermented sausages as well as in faecal samples from the relevant farm animals using a molecular approach based on PCR amplification of bacterial DNA directly extracted from specimens.
Some of the 11 AR genes were highly prevalent, the largest number being detected in chicken meat and pig faeces. The genes found most frequently in meat were tet(K) and erm(B); vanB and mecA were the least represented. All 11 determinants were detected in faecal samples except mecA, which was found only in chicken faeces. erm(B) and erm(C) were detected in all faecal samples. The frequency of AR genes was not appreciably different in meat compared to faecal specimens of the relevant animal except for vanB, which was more prevalent in faeces.
Our findings suggest that AR genes are highly prevalent in food-associated bacteria and that AR contamination is likely related to breeding rather than processing techniques.
Finally, the cultivation-independent molecular method used in this work to determine the prevalence of AR genes in foods proved to be a rapid and reliable alternative to traditional tools.
Keywords: Antibiotic resistance genes; Direct DNA recovery; Nested PCR; Meat samples

G. Urrutia-Benet, T. Balogh, J. Schneider, D. Knorr, Metastable phases during high-pressure-low-temperature processing of potatoes and their impact on quality-related parameters, Journal of Food Engineering, Volume 78, Issue 2, January 2007, Pages 375-389, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.10.006.
(http://www.sciencedirect.com/science/article/B6T8J-4HNS9ST-1/2/e704b6f2513f481701a48e8574550b78)
Abstract:
The existence of liquid and solid metastable phases within the phase diagram of water and water-containing food products has been proved to open a new range of possibilities in pressure-shift freezing (PSF) and pressure-induced thawing (PIT) processes. A reduction of processing time was obtained in a metastable region (for pressures above 200 MPa and temperatures below -20 [degree sign]C) thanks to the increment of temperature gradients (in food material, before and after pressure release, in the case of PSF, and between sample and heating medium for PIT). The enzymatic activity of polyphenoloxidase (PPO) was chosen to evaluate the effectiveness of PSF and PIT processes for food preservation, since it is dependent on the cell disruption, which is caused by ice nucleation during freezing, and crystal growth during storing and thawing. Results showed at laboratory and pilot scale that the activity of PPO was not increased after freezing and thawing processes when pressure was applied, being even slightly reduced in the metastable region. Additionally, key quality-related parameters (colour, drip loss, texture and microstructure) were evaluated at pilot scale, showing better responses for PSF and PIT than for atmospheric freezing and thawing.
Keywords: High pressure; Low temperature; Food quality; Metastable phases; Potatoes; Polyphenoloxidase

Jean-Jacques Bimbenet, Helmar Schubert, Gilles Trystram, Advances in research in food process engineering as presented at ICEF 9, Journal of Food Engineering, Volume 78, Issue 2, January 2007, Pages 390-404, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.10.020.
(http://www.sciencedirect.com/science/article/B6T8J-4J2M1GN-2/2/890cc3905f80088f9179fd3a2e4422ad)
Abstract:
Written and oral papers of ICEF 9 have treated the following themes:
- extraction and separation methods,
- mass transfer: drying, rehydration and impregnation,
- protection of product by encapsulation, coating and packaging,
- consequences of reactions and transformations on product quality,
- contribution of food process engineering to hygiene of operations and to food safety,
- heat and refrigeration treatments, cooking and frying,
- emerging technologies: high pressure, pulsed fields, combined and various treatments,
- complex products: emulsions, gels, powders, solids,
- operations modelling,
- 'intelligent systems': sensors, process control, optimisation,
- physical properties of products,
- global approaches.
This congress has shown the development of research on food process engineering (FPE) in many countries. A strong tendency is the growing attention paid to the relations between processes, products and, to some extent, persons. Complex products, emerging technologies, heat treatments were the subjects of many papers. Research tools like mathematical modelling, especially computer fluid dynamics, sophisticated methods of product characterization have been extensively presented.
Keywords: Food process engineering; Complex product; Emerging technology; Thermal processing; Modelling; Food safety

R.B. Pandit, J. Tang, F. Liu, M. Pitts, Development of a novel approach to determine heating pattern using computer vision and chemical marker (M-2) yield, Journal of Food Engineering, Volume 78, Issue 2, January 2007, Pages 522-528, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.10.039.
(http://www.sciencedirect.com/science/article/B6T8J-4HX476Y-1/2/f9629e6ff0f6043640fd8e2763147f37)
Abstract:
In this study, a novel approach to determine heating patterns using chemical marker (M-2) yield and computer vision was developed for packaged foods after microwave sterilization. Due to various constraints of temperature measurement devices such as fiber-optic temperature sensors, thermocouples, and infrared sensors, there is a need to develop an accurate and rapid method to determine heating patterns in packaged food trays after microwave sterilization. Yield of a heat sensitive chemical marker (M-2) was used as a coloring agent and digital images of the processed trays were analyzed using a computer vision system. A script in IMAQ vision builder software was written to obtain a 3-D heating pattern for the sterilized trays. Relationship between chemical marker (M-2) yield and cumulative thermal lethality (F0) was also studied. Validation of the locations of cold and hot spots determined by computer vision were performed by fiber-optics temperature measurement sensor. Results show that computer vision in combination with chemical marker M-2 and other accessories can be used as a rapid, accurate and cost efficient tool to specify the location of cold and hot spots after microwave sterilization.
Keywords: IMAQ vision builder; Chemical marker M-2; Computer vision; Machine vision; Digital image processing; Cold and hot spots; Microwave heating; Sterilization

W. Liu, N.Ab. Aziz, Z. Zhang, P.J. Fryer, Quantification of the cleaning of egg albumin deposits using micromanipulation and direct observation techniques, Journal of Food Engineering, Volume 78, Issue 1, January 2007, Pages 217-224, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.09.019.
(http://www.sciencedirect.com/science/article/B6T8J-4HHWVWW-2/2/2696885214509f53ebb44c79ee379568)
Abstract:
Cleaning of food fouling deposits in processing equipment is costly and time consuming. Fouling deposits form as a result of adhesion of species to the surface and cohesion between elements of the material. Proteins constitute the major fraction of many food fouling deposits and are notably difficult to remove. Work has been carried to determine the factors controlling removal of egg albumin deposits. A micromanipulation technique was used to measure the adhesive/cohesive strength of egg albumin deposits on a stainless steel surface. The apparent adhesive strength between the fouling deposits and the substrate was measured as the work required to remove the deposits per unit area from the surface. Measured values were between 0 and 4 J/m2, these were a function of heating temperature and time, albumin concentration, cleaning agent concentration and exposure time. The cohesive strength was greater than adhesive strength at room temperature. Observation of cleaning showed that micromanipulation measurements would be related directly to the effect of concentration on the cleaning time.
Keywords: Cleaning; Micromanipulation; Adhesive and cohesive forces; Egg ovalbumin

S.S. Sablani, S. Kasapis, M.S. Rahman, Evaluating water activity and glass transition concepts for food stability, Journal of Food Engineering, Volume 78, Issue 1, January 2007, Pages 266-271, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.09.025.
(http://www.sciencedirect.com/science/article/B6T8J-4HHWVWW-4/2/4693f0fe7565b432a04d8bca98da6671)
Abstract:
Water activity and glass transition temperature concepts were used to investigate the connection between the two distinct criteria of food stability. The data on sorption isotherms and glass transition temperatures were obtained from the literature. Two most commonly used models i.e. GAB and Gordon-Taylor equations were used to model water activity/moisture content and glass transition temperatures/solids content relationships. The models' (GAB and Gordon-Taylor) parameters were used to estimate water activity and glass transition temperature at given moisture/solids content. Results indicate that there is a considerable discrepancy in the temperature-related stability criteria predicted by the concepts of water activity (aw) and the glass phenomenon (Tg). A greater understanding of water sorption properties and Tg is required to establish a sound processing and storage stability criteria.
Keywords: Water activity; Sorption isotherms; Glass transition temperature; Storage stability

A. Legrand, M. Berthou, L. Fillaudeau, Characterization of solid-liquid suspensions (real, large non-spherical particles in non-Newtonian carrier fluid) flowing in horizontal and vertical pipes, Journal of Food Engineering, Volume 78, Issue 1, January 2007, Pages 345-355, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.10.002.
(http://www.sciencedirect.com/science/article/B6T8J-4HM82CW-1/2/989867bbc66ebaf84c4c47d2bb542b54)
Abstract:
The objective of this study is to develop a methodology based on flow visualisation in order to measure the cumulative distribution of particles in vertical and horizontal tubes and to validate it with model and real food suspensions. The cumulative particle concentration provides new information in addition to the description of suspension flow, the residence time distribution, as well as the particle to fluid relative velocity and the friction curves. The method proposed firstly enables

us to draw up a geometrical description based on a theoretical analysis of the suspension (homogeneous suspension, stationary bed) and secondly, to define the quantitative criteria issuing from the cumulative particle distribution. The cumulative distribution was investigated with a model suspension (alginate beads in CMC solution) and a real industrial product (bean mixture) versus flow-rate (from 233 up to 2922 l h-1), concentration (from 3% up to 26% w/w) and particle-to-pipe diameter ratios (from 0.187 up to 0.330). Strong analogies between model and real suspension behaviour were noted when the particle concentration increases. However noticeable differences were observed and the results show that the flow pattern depends on four major parameters: (i) the orientation of the tubes and (ii) the density differences (and associated dispersion) between the carrier fluid and the particles; but (iii) the shape and (iv) the mechanical properties of particles are factors which limit particle concentration increase and cause fluids to tend toward homogeneity.
Keywords: Solid-liquid suspension; Particle food; Horizontal and vertical tubes; Food processing; Flow characterisation

Natraj Krishnan, Dalibor Kodrik, Ferit Turanli, Frantisek Sehnal, Stage-specific distribution of oxidative radicals and antioxidant enzymes in the midgut of Leptinotarsa decemlineata, Journal of Insect Physiology, Volume 53, Issue 1, January 2007, Pages 67-74, ISSN 0022-1910, DOI: 10.1016/j.jinsphys.2006.10.001.
(http://www.sciencedirect.com/science/article/B6T3F-4M39R51-3/2/ea0a773c4b497da7c205df993923a0cb)
Abstract:
The titers of reactive oxygen species (ROS) represented by superoxide anion and general peroxides, and the activities of antioxidant enzymes superoxide dismutase (SOD) and catalase (CAT), are regulated in the midgut of the Colorado potato beetle (CPB) relative to the gut compartment, developmental stage, and food intake. ROS concentration is low in the potato leaves but it is very high in their digest in insect's anterior midgut. It is proposed that intensive ROS production in this gut region is linked to the processing of allelochemicals. SOD and CAT activities, low oxygen tension, and unidentified redox systems that maintain a slightly reducing milieu in the midgut lumen (pe+pH=6.95 declining to 5.36), obviously contribute to the decrease of ROS concentration along the gut length to a minimum in the wall of posterior midgut region. SOD and CAT activities are higher in the potato leaves than in the midgut tissues but the role of plant enzymes in ROS elimination within the gut lumen remains to be shown. A lower level of ROS and a higher antioxidant potential in the adult than in the larval midgut indicate stage specificity in the management of oxidative stress. The antioxidant defense is high in the diapausing adults that contain no detectable superoxide and about ten times less peroxides than the reproducing adults.
Keywords: Catalase; Insect digestion; Peroxides; Superoxide anion; Superoxide dismutase

F. Fleurat-Lessard, M. Chaurand, G. Marchegay, J. Abecassis, Effects of processing on the distribution of pirimiphos-methyl residues in milling fractions of durum wheat, Journal of Stored Products Research, Volume 43, Issue 4, 2007, Pages 384-395, ISSN 0022-474X, DOI: 10.1016/j.jspr.2006.12.002.
(http://www.sciencedirect.com/science/article/B6T8Y-4NB2SKH-1/2/d2c47140d16e17841f03e08ac90ac107)
Abstract:
Three hundred kilograms of durum wheat of two cultivars `primadur' (small kernel) and `ardente' (large kernel) treated with pirimiphos-methyl (PMM) at 10 mg kg-1 were processed into fractions under standard conditions of milling to evaluate the fate and distribution of the residues in the milling fractions. Half the quantity of each variety was processed 7 d after the treatment, and the second half was stored for 127 d in controlled conditions before milling. The residue content in treated grain just before milling as well as in the final 18 milling fractions was determined by GC-

MS analysis carried out on crude methanol extracts. During the 127-d storage period, nearly 65% of the PMM initial content was degraded. With the first sub-sample (7 d after treatment), the amount of residue in the processed fractions compared to the total amount in grain prior to milling was reduced by 12.3% and 26.5% for primadur and ardente varieties, respectively. With the 2nd sub-sample (127 d after treatment), the residue losses induced by the milling operations were 21.8% and 24.6%, respectively. Between 79.5% and 74.5%, respectively, of the total amount of recovered residues after milling was concentrated in the bran layers 7 d after treatment and 79.5% and 80.2% after 127 d. The translocation of the residues during milling from the bran-coat to the inner endosperm was significant in all cases: a fraction from 14% to 20% of the total residue content was drawn into the semolina. An interaction between the milling operations and the residue translocation was observed. The greater translocation observed with the ardente cultivar was related to the specific characteristics of the bran-coat structure of this durum variety. With the grain batch held for the longer term, a lower rate of translocation was observed as the level of PMM fell to about a third of that at 7 d. A scenario of the behaviour of the residues during milling in relation to processing and grain conditions was proposed for the assessment of the maximum amount of PMM residues in the premium semolina fractions. The impact for consumer's health of this residual contamination of semolina used for food purposes is discussed.
Keywords: Organophosphate insecticide; Pirimiphos-methyl; Durum wheat; Residue content; Milling; Residue translocation; Semolina; Flour; Pericarp layer

N.C. Tipton, D.A. King, J.C. Paschal, D.S. Hale, J.W. Savell, Effects of oral vitamin D3 supplementation and supplement withdrawal on the accumulation of magnesium, calcium, and vitamin D in the serum, liver, and muscle tissue and subsequent carcass and meat quality of Bos indicus influenced cattle, Meat Science, Volume 75, Issue 1, January 2007, Pages 150-158, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2006.06.024.
(http://www.sciencedirect.com/science/article/B6T9G-4KV3Y4X-1/2/e52e9344a912b3e3768173a21bb6d66f)
Abstract:
Bos indicus crossbred cattle (n = 79) were fed vitamin D3 (0 or 3 million IU/hd/d) for 5 d. Afterwards, half of each group was slaughtered immediately, while half was fed, without supplementation, for 7 d before processing. Serum calcium concentration was increased ($P < 0.05$) in cattle after supplement removal, but not immediately following supplementation. This also was observed in the M. longissimus lumborum and M. triceps brachii, but not in the M. semitendinosus. Liver biopsy vitamin D3 concentrations were higher ($P < 0.05$) in supplemented cattle immediately following supplementation, but were not different from controls after supplement removal. Vitamin D3 did not affect tenderness at supplement removal day 0, but increased the tenderness of the M. longissimus lumborum and M. semitendinosus at supplement removal day 7. Vitamin D3 supplementation improves muscle tenderness and may be more effective when supplementation is ceased 7 d before slaughter, with minimum food safety concerns.
Keywords: Beef; Bos indicus; Carcass quality; Meat quality; Tenderness; Vitamin D3

Gotz Laible, Brigid Brophy, Derek Knighton, David N. Wells, Compositional analysis of dairy products derived from clones and cloned transgenic cattle, Theriogenology, Volume 67, Issue 1, IETS 2007 Pre-Conference Symposia, IETS 2007, 1 January 2007, Pages 166-177, ISSN 0093-691X, DOI: 10.1016/j.theriogenology.2006.09.028.
(http://www.sciencedirect.com/science/article/B6TCM-4M4TNH9-1/2/f565c7c1ae0525d9fc522fa3e5322659)
Abstract:
Cloning technology is an emerging biotechnological tool that could provide commercial opportunities for livestock agriculture. However, the process is very inefficient and the molecular events underlying the technology are poorly understood. The resulting uncertainties are causing

concerns regarding the safety of food products derived from cloned livestock. There are similar concerns for livestock produced by biotechnologies which enable the purposeful introduction of genetic modifications. To increase the knowledge about food products from animals generated by these modern biotechnologies, we assessed compositional differences associated with milk and cheese derived from cloned and transgenic cows. Based on gross composition, fatty acid and amino acid profiles and mineral and vitamin contents, milk produced by clones and conventional cattle were essentially similar and consistent with reference values from dairy cows farmed in the same region under similar conditions. Whereas colostrum produced by transgenic cows with additional casein genes had similar IgG secretion levels and kinetics to control cows, milk from the transgenic cows had a distinct yellow appearance, in contrast to the white color of milk from control cows. Processing of milk into cheese resulted in differences in the gross composition and amino acid profiles; `transgenic' cheese had lower fat and higher salt contents and small but characteristic differences in the amino acid profile compared to control cheese.
Keywords: Nuclear transfer; Bovine; Transgenic; Milk composition; Cheese

Huub Lelieveld, Larry Keener, Global harmonization of food regulations and legislation--the Global Harmonization Initiative, Trends in Food Science & Technology, Volume 18, Supplement 1, January 2007, Pages S15-S19, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.08.005.
(http://www.sciencedirect.com/science/article/B6VHY-4M7VB20-1/2/5750925476a2799ecacc8bae188e5ec8)
Abstract:
It is generally assumed around the world that food is safe. Food must be safe, for its intended use for human consumption, but food safety and regulatory measures should not unnecessarily hamper the availability of human food or hamper the introduction of novel processing methods aimed at retaining the natural healthy properties of food.

Test Methods Subgroup of the EHEDG, A method for assessing the in-place cleanability of food-processing equipment, Trends in Food Science & Technology, Volume 18, Supplement 1, January 2007, Pages S54-S58, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.11.021.
(http://www.sciencedirect.com/science/article/B6VHY-4MMFX6S-G/2/09c9171c16bab1a22684b4393ed3de24)
Abstract:
To facilitate the design, testing and maintenance of hygienic food-processing equipment, it is important to be able to assess the relative cleanability of various components of the equipment using standardized test procedures that have been developed from a sound scientific basis. This paper summarizes the procedures recommended by the Test Methods subgroup of the European Hygienic Equipment Design Group (EHEDG). This paper is the second in a series of articles featuring the EHEDG to be published in Trends in Food Science & Technology. The EHEDG is an independent consortium formed to develop guidelines and test methods for the safe and hygienic processing of food. The group includes representatives from research institutes, the food industry, equipment manufacturers and government organizations in Europe.

Mary Moon, How clean are your lubricants?, Trends in Food Science & Technology, Volume 18, Supplement 1, January 2007, Pages S74-S79, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.11.002.
(http://www.sciencedirect.com/science/article/B6VHY-4MJS01V-2/2/bb028343fd88bfde64f2f84429a0d7aa)
Abstract:
The lubrication industry strives continuously to meet the evolving needs of the food processing industry. For example, NSF H1 registered food grade lubricants can minimize risks associated with low levels of lubricant contamination in foods and beverages. However, contaminants can compromise the performance of any lubricant. Furthermore, microscopic particle contaminants can

cause irreversible damage to machinery. This article discusses sources of contamination, their deleterious effects, methods to measure particle contamination, and means to ensure lubricant cleanliness.

B.B.B. Jensen, Training - A prerequisite in hygienic food processing, Trends in Food Science & Technology, Volume 18, Supplement 1, January 2007, Pages S101-S106, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.10.004.
(http://www.sciencedirect.com/science/article/B6VHY-4MGVJ22-3/2/402e60f898e45a3c3e463b4c04784011)

R.R. Maller, Passivation of stainless steel, Trends in Food Science & Technology, Volume 18, Supplement 1, January 2007, Pages S112-S115, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.11.020.
(http://www.sciencedirect.com/science/article/B6VHY-4MMFX6S-S/2/1af1dfabaf4ffd101b50f30b029713f5)
Abstract:
This paper, the 18th in a series of articles on the hygienic design of food processing equipment published in TIFS, introduces the first joint EHEDG/3-A Update article in the series, a set of guidelines for the hygienic passivation of stainless steel surfaces intended for food-contact use. These guidelines have been prepared on behalf of the US-based 3-A Steering Committee and the Sanitary Standards Sub-committee of the Dairy Industry/Farm Industry Committee, in addition to the European Hygienic Equipment Design Group (EHEDG).

Guoxiang Chao, Yunfei Deng, Xiaohui Zhou, Qin Xu, Xiaoqin Qian, Liping Zhou, Binyang Zhu, Prevalence of Listeria monocytogenes in delicatessen food products in China, Food Control, Volume 17, Issue 12, December 2006, Pages 971-974, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.06.016.
(http://www.sciencedirect.com/science/article/B6T6S-4H3Y9M5-1/2/82011b7fa383d69131aa7b9a4d4b4f5f)
Abstract:
This study was to investigate the prevalence of Listeria monocytogenes in delicatessen food, raw materials and environmental samples in food processing chain. Two hundred and forty-five samples of delicatessen foods in markets, 98 samples of cooked foods from restaurants and hotels, 154 samples of food product contact surfaces such as counters, iceboxes and chopping blocks etc. from processing and selling sites, 51 environmental samples from the food-cooking rooms of restaurants and hotels were collected and detected for the prevalence of L. monocytogenes. The results showed that there were 32 strains isolated from delicatessen foods in the market and the average prevalence was 13.06% which is significantly higher ($p < 0.01$) than those isolated from cooked foods in hotels and restaurants (1.02%) suggesting that the delicatessen food products may be contaminated during the delivery from hotels and restaurants to the markets. Ten strains were isolated from 335 raw materials and 21 strains were isolated from 154 processing equipments in selling and processing sites. No strains were isolated from 51 samples of equipments in cooked food rooms of hotels and restaurants. The study shows that the prevalence of L. monocytogenes in delicatessen foods in the market was significantly higher than those in the cooked foods of hotels and restaurants, and therefore, the critical control points were: (1) to establish relative closed selling rooms; (2) to establish the sterilizing measures to keep the delicatessens from being contaminated with L. monocytogenes during the delivery from restaurants or hotels to the retail markets.
Keywords: Delicatessen foods; Listeria monocytogens; Critical control points (CCPs)

Barry M. Popkin, Technology, transport, globalization and the nutrition transition food policy, Food Policy, Volume 31, Issue 6, December 2006, Pages 554-569, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2006.02.008.
(http://www.sciencedirect.com/science/article/B6VCB-4JRVDB9-5/2/e2b5b03afa2484a437decddf65d8c048)
Abstract:
Diet and activity have been affected by the rapid worldwide shifts in technological innovations reducing energy expenditures during leisure, transportation, and work; globalized modern food processing, marketing and distribution techniques; global mass media. The increases occur increasingly in rural areas on all continents. The resultant global increase in obesity increasingly is shifting the burden of obesity to the poor. While few direct linkages between globalization of trade in goods, services, and technology can be directly linked to diet and activity, a strong case exists for globalization's role as a key underlying force behind this stage of the nutrition transition.
Keywords: Globalization; Nutrition transition; Dietary changes; Obesity

Madhuchhanda Bhattacharya, Tanmay Basak, On the analysis of microwave power and heating characteristics for food processing: Asymptotes and resonances, Food Research International, Volume 39, Issue 10, Physical Properties VI, December 2006, Pages 1046-1057, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.09.012.
(http://www.sciencedirect.com/science/article/B6T6V-4M7VB11-1/2/caa9b2f4f38b1bc0f98e3cf5fe568304)
Abstract:
This paper presents a comprehensive analysis on microwave power absorption and associated heating characteristics for various food materials. The analysis is based on a closed form solution, which is derived from the first principle. It has been shown that both absorbed power distributions and average absorbed power exhibit three distinct behaviors as sample length (2L) is varied from 2L << [lambda]m/2[pi] to 2L >> Dp, where [lambda]m and Dp are wavelength and penetration depth within the material, respectively. These three regimes are termed as thin (2L << [lambda]m/2[pi]), resonating ([lambda]m/2[pi] 2L Dp) and thick (2L >> Dp) samples. A complete characterization of absorbed power has been established in all the three regimes. This work also provides a correlation for the prediction of resonating sample lengths, which for the first time takes into account the effect of dielectric properties ([lambda]m and Dp) of the material and free space and also the influence of various distributions of microwave incidence. It has been shown that the closed form analysis on absorbed power presented in this work can be used to forecast the heating characteristics and various distributions of microwave incidence may be used to suitably alter the heating characteristics. Overall, the analysis presented in this work can be used as a guideline to predict optimal heating strategy for microwave assisted food processing.
Keywords: Microwave; Heating; Foodstuffs; Power

Franco Pedreschi, Jorge Leon, Domingo Mery, Pedro Moyano, Development of a computer vision system to measure the color of potato chips, Food Research International, Volume 39, Issue 10, Physical Properties VI, December 2006, Pages 1092-1098, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.03.009.
(http://www.sciencedirect.com/science/article/B6T6V-4JRVR47-2/2/5fb514144910614a06446a5631d9e2a8)
Abstract:
The objective of this research was to design and implement an inexpensive computer vision system for measuring the color of a highly heterogeneous food material not only in shape as well in color such as potato chips in L*a*b* units from RGB images. The system was composed of (i) a digital color camera for acquiring the images in a digital format, (ii) a computer for storage the images, (c) image analysis routines integrated into a software programmed in Matlab that converts

the color RGB of the food image into L*a*b* units. In this way the color of potato chips can be calculated in L*a*b* units over representative areas and in a reproducible way. The kinetics of color changes in potato slices during frying at four temperatures was followed using the implemented computer vision system (CVS). Color values in L*a*b* units were recorded at different sampling times during frying at the four oil temperatures using the total color change parameter ([Delta]E). Chips fried at higher temperatures get darker as expected and showed by the CVS. The implemented computer vision system can be used to study as well foods different from potato chips by selecting their proper settings for image acquisition and digital image processing.
Keywords: Potato chips; Frying; Color; Computer vision; L*a*b*; Image processing

Ian Wilson, Tony Hasting, Special Issue--Fouling, Cleaning and Disinfection in Food Processing 2006, Food and Bioproducts Processing, Volume 84, Issue 4, Fouling, Cleaning and Disinfection in Food Processing, December 2006, Pages 251-252, ISSN 0960-3085, DOI: 10.1205/fbp.ed.0604.
(http://www.sciencedirect.com/science/article/B8JGD-4RV2DDW-1/2/0bdbfc1d960811a716112648db9e22b0)

A. Parbhu, S. Hendy, M. Danne, Reducing Milk Protein Adhesion Rates: A Transient Surface Treatment of Stainless Steel, Food and Bioproducts Processing, Volume 84, Issue 4, Fouling, Cleaning and Disinfection in Food Processing, December 2006, Pages 274-278, ISSN 0960-3085, DOI: 10.1205/fbp06025.
(http://www.sciencedirect.com/science/article/B8JGD-4RV2DDW-5/2/9177045a5032290cab07125a1a028f5c)
Abstract:
The primary factor in developing a surface that diminishes fouling during food processing is reducing the rate of formation of the initial foulant layer. Modifying the properties of plant processing surfaces, which are typically 316 L or 304 L stainless steel, is one way of achieving a reduction in initial adhesion rate. We have developed a transient treatment that modifies the surface properties of the metal oxide surface, that is shown to reduce the interaction potential between the stainless steel processing surface and phosphate anions. The phosphate anions are involved in the conditioning layer associated with foulant formation during milk processing. The transient nature of the treatment is that it is present during the processing cycle, but is removed at high pH, which is an environment that exists during the cleaning cycle.
The transient surface treatment was utilized in fouling trials, conducted in a pilot plant milk pasteurizer, a model system to emulate milk fouling in industrial plant. Evaluation of the result shows significant reductions in fouling rates compared to the typical controls, as indicated by the pressure drop across the plate heat exchanger and the observed reduction in the fouling of the heat exchanger plate.
Keywords: AFM; fouling; surface treatment; milk fouling

A.A. Hosni, A. Jang, M. Coughlin, P.L. Bishop, Diffusion of Chlorine Dioxide Through Aqueous and Oil Films, Food and Bioproducts Processing, Volume 84, Issue 4, Fouling, Cleaning and Disinfection in Food Processing, December 2006, Pages 346-352, ISSN 0960-3085, DOI: 10.1205/fbp06023.
(http://www.sciencedirect.com/science/article/B8JGD-4RV2DDW-G/2/7c980fceeed21708fc42b017ac4b5d84)
Abstract:
Since chlorine dioxide generation methods have become simpler and safer, this antimicrobial agent is used in an increasing number of applications in the food industry. Contaminated food processing equipment is now commonly sanitized by immersion or spray application of chlorine

dioxide solutions. The contact time needed to kill or deactivate bacteria is in part related to the solution concentration. Accordingly, a working ClO2 microelectrode was coupled with a reference microelectrode to investigate the depletion of ClO2 concentration in thin aqueous films. The depletion of chlorine dioxide concentration in thick and thin films was recorded. Thin films were examined both with and without the addition of a surfactant. Profiles showed that the ClO2 residual in thick films lasted up to 6 h. In thin films, the addition of a surfactant decreased the film thickness by almost half, and the ClO2 profile depletion time was reduced from about an hour to about 25 min. A correlation relating the film depth to the recorded decay coefficient is reported. The behaviour of chlorine dioxide was investigated to determine whether chlorine dioxide could partition with and break through fatty acid layers that would be encountered in soiled food processing equipment.Experiments with caprylic acid showed the ability of chlorine to break through lipid layers and thus disinfect the biofilm that might exist below it.
Keywords: chorine dioxide; microelectrodes; disinfection; food hygiene

, List of Referees 2006, Food and Bioproducts Processing, Volume 84, Issue 4, Fouling, Cleaning and Disinfection in Food Processing, December 2006, Pages 375-377, ISSN 0960-3085, DOI: 10.1205/fbp.lr.0604.
(http://www.sciencedirect.com/science/article/B8JGD-4RV2DDW-R/2/60a36d9b0b44ecfa79f8420f3fd5b529)
Abstract:
The Editorial Board of the Transactions of the Institution of Chemical Engineers gratefully acknowledge the assistance of the following persons who refereed papers submitted for consideration for publication in Part A (Chemical Engineering Research and Design), Part B (Process Safety and Environmental Protection) and Part C (Food and Bioproducts Processing) during the period 1 September 2005 to 31 August 2006.

Suzanne A. Kulshrestha, Sudhir K. Sastry, Low-frequency dielectric changes in cellular food material from ohmic heating: Effect of end point temperature, Innovative Food Science & Emerging Technologies, Volume 7, Issue 4, December 2006, Pages 257-262, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.03.004.
(http://www.sciencedirect.com/science/article/B6W6D-4KJ750H-2/2/ceee5581b9e05d53aaf0b258148528a5)
Abstract:
The effect of ohmic heating on cell membranes of cellular food material was investigated by measurement of dielectric spectra from 100 Hz to 20 kHz. Cylinders of potato were placed in a glass static ohmic heater and heated, either conventionally or ohmically, to various temperatures ranging from 30 [degree sign]C to 70 [degree sign]C. After cooling to 25 [degree sign]C, the ohmically heated samples had significantly higher electrical conductivity than conventionally heated samples at all measurement frequencies for endpoint temperatures of 40 [degree sign]C and 50 [degree sign]C. At low frequencies, the apparent dielectric constant was also higher for these samples, but at high frequencies, the reverse pattern was shown. The ohmically heated samples apparently have greater membrane permeability than conventionally heated samples when heated to temperatures below 60 [degree sign]C. This is reflected in the diffusion of KCl solution into the tissues, which is faster at higher endpoint temperatures.Industrial relevance
This paper deals with electro-permeabilisation of biological cells during ohmic heating of plant foods. It is of industrial interest and relevance to evaluate the electroporation of cellular material during ohmic heating and to establish a comparison of the effectiveness of membrane permeabilisation via pulsed electric field treatment (PEF), ohmic heating (OH) and thermal processing, as well as combinations of PEF or OH with mild heat treatment. Such data would allow to develop the most energy effective process with resulting optimum product functionality, safety and nutritial quality characteristics.

Keywords: Ohmic; Moderate electric field; Dielectric; Conductivity; Temperature; Electroporation

Markus R. Mo[ss]hammer, Florian C. Stintzing, Reinhold Carle, Evaluation of different methods for the production of juice concentrates and fruit powders from cactus pear, Innovative Food Science & Emerging Technologies, Volume 7, Issue 4, December 2006, Pages 275-287, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.04.003.
(http://www.sciencedirect.com/science/article/B6W6D-4K4PSRX-1/2/526880789d5c7a047550eaedbee58dd5)
Abstract:
The present work aimed both at improvement and extension of a previously developed process for the production of cactus pear juice. The total yield was increased by 10% through processing whole instead of peeled fruits and by further optimisation of pulp enzymation. As an alternative to HTST pasteurisation, cross-flow microfiltration was applied for non-thermal cactus pear juice preservation. Juice concentrates and fruit powders were produced by rotary evaporation and freeze drying at laboratory scale and compared to products obtained at pilot plant-scale applying a three-stage column evaporator and spray drying, respectively. To monitor process-related quality changes, the resulting products were characterised in terms of colour and selected quality parameters. For both juice concentrates and fruit powders, initial colour characteristics were retained. In addition to betanin isomerisation, C11-epimerisation of proline-betaxanthin was demonstrated to be a valuable indicator of the respective heat treatment applied. Whereas no adverse reactions were observed during juice production, non-enzymatic browning and HMF formation were found after concentration at pilot plant-scale and freeze drying, respectively.Industrial relevance
Although cactus pear meets all requirements for food colouring purposes, no attempt has been made so far to exploit this potential. The feasibility of processing cactus pear juice into concentrates and fruit powders was demonstrated in this study. In contrast to single-strength juice, concentrates and powders are easier to handle during transportation and storage and also open further fields of application that may promote cactus pear fruit processing at industrial scale in the future.
Keywords: Cactus pear; Opuntia ficus-indica; Juice concentrate; Fruit powder; Colouring foodstuff; Natural colourants; Betalains

T.A. McMeekin, J. Baranyi, J. Bowman, P. Dalgaard, M. Kirk, T. Ross, S. Schmid, M.H. Zwietering, Information systems in food safety management, International Journal of Food Microbiology, Volume 112, Issue 3, 1 December 2006, Pages 181-194, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.04.048.
(http://www.sciencedirect.com/science/article/B6T7K-4KRY3GW-3/2/3f24382bafbfda03d7f3f34f78810f3b)
Abstract:
Information systems are concerned with data capture, storage, analysis and retrieval. In the context of food safety management they are vital to assist decision making in a short time frame, potentially allowing decisions to be made and practices to be actioned in real time.
Databases with information on microorganisms pertinent to the identification of foodborne pathogens, response of microbial populations to the environment and characteristics of foods and processing conditions are the cornerstone of food safety management systems. Such databases find application in:
[circle, open] Identifying pathogens in food at the genus or species level using applied systematics in automated ways.
[circle, open] Identifying pathogens below the species level by molecular subtyping, an approach successfully applied in epidemiological investigations of foodborne disease and the basis for national surveillance programs.

[circle, open] Predictive modelling software, such as the Pathogen Modeling Program and Growth Predictor (that took over the main functions of Food Micromodel) the raw data of which were combined as the genesis of an international web based searchable database (ComBase).
[circle, open] Expert systems combining databases on microbial characteristics, food composition and processing information with the resulting 'pattern match' indicating problems that may arise from changes in product formulation or processing conditions.
[circle, open] Computer software packages to aid the practical application of HACCP and risk assessment and decision trees to bring logical sequences to establishing and modifying food safety management practices.
In addition there are many other uses of information systems that benefit food safety more globally, including:
[circle, open] Rapid dissemination of information on foodborne disease outbreaks via websites or list servers carrying commentary from many sources, including the press and interest groups, on the reasons for and consequences of foodborne disease incidents.
[circle, open] Active surveillance networks allowing rapid dissemination of molecular subtyping information between public health agencies to detect foodborne outbreaks and limit the spread of human disease.
[circle, open] Traceability of individual animals or crops from (or before) conception or germination to the consumer as an integral part of food supply chain management.
[circle, open] Provision of high quality, online educational packages to food industry personnel otherwise precluded from access to such courses.
Keywords: Information systems; Databases; Applied systematics; Applications software; Knowledge management; RFID technology

S. Brul, F. Schuren, R. Montijn, B.J.F. Keijser, H. van der Spek, S.J.C.M. Oomes, The impact of functional genomics on microbiological food quality and safety, International Journal of Food Microbiology, Volume 112, Issue 3, 1 December 2006, Pages 195-199, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.04.014.
(http://www.sciencedirect.com/science/article/B6T7K-4K606C6-1/2/c85355de949da8d0d4fc551b0e098144)
Abstract:
In the food processing industry, unwanted occurrence and growth of spoilage and pathogenic microorganisms is a key concern. A prime example is the extremely heat resistant bacterial endospores, microbial survival structures, that create problems due to their ability to survive classical thermal treatments and their ability to subsequently germinate and form actively growing vegetative cells. Research on food spoilage Bacillus subtilis isolates using the Amplified Fragment Length Polymorphism (AFLP) technology and micro-array technology has identified a number of genomic factors correlated to the level of spore heat resistance. Strains could be classified according to these genomic markers. In addition, it was shown with the sequenced B. subtilis laboratory strain that sporulation in the presence of in particular calcium ions in a cocktail of calcium, magnesium, iron, manganese and potassium promotes thermal resistance of developing spores. This physiological observation correlated with an increased expression during sporulation of genes encoding small acid soluble spore proteins.
Screening of ingredients using DNA-chip based techniques identifying the above indicated molecular markers, should allow in the future the identification of the occurrence of spoilage and pathogenic bacteria and prediction of their thermal preservation stress resistance. Currently various projects aiming at the integration of genomics data and micro(nano)-technology, a prerequisite if the alluded to ingredient Quality Control is going to succeed, are running or are being set-up. Information from these projects will be used together with the requirements of product organoleptic quality to derive robust integrated food safety and food quality processing parameters. Such parameters should form the basis of future food Quality Assurance systems.

Keywords: Genomics; Food processing; Food preservation; Bacterial spore formers; Models; Resistance

Fatima A. Miller, Teresa R.S. Brandao, Paula Teixeira, Cristina L.M. Silva, Recovery of heat-injured Listeria innocua, International Journal of Food Microbiology, Volume 112, Issue 3, 1 December 2006, Pages 261-265, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.04.013.
(http://www.sciencedirect.com/science/article/B6T7K-4K717MF-1/2/70b9ef7d03dfe62c52a95655f841323d)
Abstract:
Listeria innocuawas subjected to thermal inactivation and the extent of heat-injured cells was quantified. Cultures were heated in liquid medium for different times, using temperatures in the range of 52.5 to 65.0 [degree sign]C, and plated on Tryptic Soy Agar with 0.6% yeast extract (TSAYE) used as non-selective medium and on TSAYE plus 5% NaCl (TSAYE + NaCl) and Palcam agar with selective supplement (Palcam agar) as selective media. The difference observed in counts in non-selective and in selective media gave an indication of cell injury during the heat treatment. D- and z- values were calculated for all conditions considered. For each temperature, D-values obtained using non-selective recovery procedures were higher than the ones obtained using the two selective media. When comparing the selective media, it can be concluded that Palcam agar allowed recovery and growth of thermally injured cells and so it was less inhibitor than TSAYE + NaCl. Another important result was the influence of temperature on the degree of cellular injury. As temperature increases, the degree of heat-injured cells also increases, and consequently concern has to be taken with the temperature and the counting medium used in food processing studies. The results of this work clearly demonstrated that selective media used for Listeria monocytogenes enumeration/detection might not be suitable for the recovery of heat-injured cells, which can dangerously underestimate the presence of this foodborne pathogen.
Keywords: Listeria innocua; Thermal inactivation; Injury; Recovery

Bernhard Meyer, Does microbial resistance to biocides create a hazard to food hygiene?, International Journal of Food Microbiology, Volume 112, Issue 3, 1 December 2006, Pages 275-279, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.04.012.
(http://www.sciencedirect.com/science/article/B6T7K-4K5JVM9-1/2/db6f680a61fa4f640dbe95f62fc50ff0)
Abstract:
Numerous reports are available on microbial resistance to antibiotics as well as to biocides. Instances of cross-resistance between these substance groups have been reported. Resistance, which is a genetically determined phenomenon, has to be distinguished from phenotypic adaptation processes, which are not hereditary. Adaptation can be avoided by rigorous cleaning and disinfection, avoiding concentrations of disinfectants below the microbicidal concentration. Resistance phenomena have to be divided into intrinsic and acquired resistance. Intrinsic resistance is the naturally greater resistance of certain microbial species compared to others. The term acquired resistance is used if certain strains of a microbial species differ significantly in their susceptibility to biocides compared to the average of this species. An overview of existing reports of resistance to different biocidal substances is given. In most of these reports, resistance is defined as an elevated minimum inhibitory concentration. The relevance of these data for disinfection processes, where microbicidal concentrations are applied, is discussed. Rotational use of different types of disinfectants, to avoid development of resistance, has been discussed controversially. Because of the unspecific mechanism of action of biocides, and the lack of scientific evidence for its need, rotational use of disinfectants is not recommended. In conclusion the risk of hazards in food production and processing caused by resistance to biocides is regarded as low.

Keywords: Disinfection; Biocides; Resistance; Rotational use

Loong-Tak Lim, Handbook of Frozen Food Processing and Packaging, edited by Da-Wen Sun, Published by: CRC Press, Taylor and Francis Group, Boca Raton, FL, ISBN 1-57444-607-X., Trends in Food Science & Technology, Volume 17, Issue 12, December 2006, Pages 662-663, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.07.005.
(http://www.sciencedirect.com/science/article/B6VHY-4KKFP6R-1/2/1be6bb4eccc437d547376c2cb925cf2b)

Susan Allport, The missing nutrient: Omega-3s and the Western diet, Appetite, Volume 47, Issue 3, November 2006, Page 385, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.08.007.
(http://www.sciencedirect.com/science/article/B6WB2-4M62JN4-5/2/7a831598417a9059902f4a40083df233)
Abstract:
How Western nations became deficient in the most abundant fat on earth, the parent omega-3 or alpha linolenic acid, is a fascinating tale that involves both food processing techniques and decades of misguided nutritional advice. It is a tale that was unraveled by scientists in Denmark, Canada, Australia, Israel, the United States and England over the course of decades and one that needs to be told before we can remedy this situation and the many diseases associated with this deficiency. This story is told in full in my book, The Queen of Fats: Omega-3s and the Western Diet (to be published by the University of California Press in 2006). For those with a critical and global view of food issues, it is clear that there are enormous health consequences of this dietary oversight (not just heart disease but also cancer, diabetes, and obesity). Scientists have learned that the two families of polyunsaturated fats, omega-3s and omega-6s, one derived from leaves and the other from seeds and both essential to human health, compete for positions in cells but affect cells in very different ways. From this understanding of the role of these essential fats in healthy diets, it is evident that eating fish is not the only way, nor is it the best way, of addressing the nutritional problem of the missing omega-3s.

Annie Hauck-Lawson, All in the family: New York food voice narratives, Appetite, Volume 47, Issue 3, November 2006, Page 390, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.08.024.
(http://www.sciencedirect.com/science/article/B6WB2-4M62JN4-S/2/d75253662936d7df9387d3e6a1f1617f)
Abstract:
New York is ripe in its potential for expression and grounding through food where, throughout the city, production, processing, preparation, gathering, and eating occur in varied forms. One part of a book about New York City foodways (Columbia University Press, forthcoming) includes four food voice narratives. This presentation excerpts three of them as illustration of the common ground of family with different food voice tenors. Bronx, Manhattan, and Brooklyn-based narratives are in process: one uses Joseph Campbell's mythic structure as a frame to tell the story of redemption through food and an enduring peace with/piece of her Bronx grandmother's soul. In another, the owner of a Manhattan-based ethnic food store ponders the history of and his relationship to the family business and finds that there is a soul within. Finally, a writer describes her foodways-centered upbringing which, after archival and ethnographic research later in life, connects and weaves into the fabric of the food history of Brooklyn.

Julie Morand-Ferron, Melisa Veillette, Louis Lefebvre, Stealing of dunked food in Carib grackles (Quiscalus lugubris), Behavioural Processes, Volume 73, Issue 3, 1 November 2006, Pages 342-347, ISSN 0376-6357, DOI: 10.1016/j.beproc.2006.08.006.
(http://www.sciencedirect.com/science/article/B6T2J-4KXVCY6-1/2/43e0e649ceaa771b4ef42ef00b2deb4a)

Abstract:
The use of tool or tool-like food processing behaviours can render animals vulnerable to theft (kleptoparasitism) because (1) large, nutritious items are usually involved, (2) value is added to the food due to long and/or complex handling, and (3) physical control of items is often temporarily lost during handling. In Barbados, Carib grackles (Quiscalus lugubris) immersing items in water before consumption (a behaviour known as food dunking) lose a larger proportion of items to conspecific food thieves than grackles that do not dunk. In this paper, we first show that dunking in Carib grackles functions as a proto-tool food-processing technique that speeds up ingestion. We then examine five potential predictors of kleptoparasitism: only conspecific density and loss of physical control on food were found to influence the probability that birds would be attacked and successfully robbed of food by conspecifics. Grackles could reduce the probability of kleptoparasitism by holding items in the bill while dunking and engaging in head-up displays. These behaviours were used flexibly depending on variation in the risk of kleptoparasitism. We suggest that costs like the ones incurred from theft might limit the profitability and frequency of tool and proto-tool food processing behaviours, creating a context where counter-strategies might be selected.
Keywords: Anti-kleptoparasitic tactic; Food processing; Kleptoparasitism; Tool use

Andres Moure, J. Sineiro, Herminia Dominguez, Juan Carlos Parajo, Functionality of oilseed protein products: A review, Food Research International, Volume 39, Issue 9, November 2006, Pages 945-963, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.07.002.
(http://www.sciencedirect.com/science/article/B6T6V-4KNMB07-3/2/3954626a908c873a1fba0f97b694b06c)
Abstract:
Oilseed proteins and modified or processed oilseed proteins can be incorporated into foods to impart nutritive value and functional properties. Processing of vegetable protein involves physico-chemical and thermal treatments, affecting the nutritional value of the final products, and also the functional properties. Conversely, functional properties (solubility, water and oil retention capacity, foaming capacity and stability, emulsion capacity and stability, viscosity, gelation) influence protein behaviour during processing and storage. These properties can be modified by chemical and enzymatic treatment. Data corresponding to diverse oilseeds and from different deffating and extraction processes have been complied and grouped according to the protein content into meals, concentrates, and isolates. Three groups of technological properties of interest for the formulation of proteinic food products from oilseeds were considered: (i) properties related to hydration mechanisms, (ii) properties related to protein structure and rheology and (iii) properties related to protein surface.
Keywords: Oilseed protein; Concentrates; Isolates; Meals; Functional properties

R. Lopez-Fandino, J. Otte, J. van Camp, Physiological, chemical and technological aspects of milk-protein-derived peptides with antihypertensive and ACE-inhibitory activity, International Dairy Journal, Volume 16, Issue 11, Technological and Health Aspects of Bioactive Components of Milk, Technological and Health Aspects of Bioactive Components of Milk, November 2006, Pages 1277-1293, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2006.06.004.
(http://www.sciencedirect.com/science/article/B6T7C-4KSSW86-2/2/9b973d7798053bb024703dfe27f27188)
Abstract:
Among the bioactive peptides derived from milk proteins, those with blood pressure-lowering effects are receiving special attention due to the prevalence and importance of hypertension in the Western population. A few antihypertensive products based on milk-protein-derived peptides with clinically proven health benefits already exist. This paper reviews the current literature on milk-derived peptides with antihypertensive effects. The structure-activity characteristics of angiotensin

converting enzyme (ACE) inhibitory peptides are discussed, as well as their bioavailability, potential physiological affects and the existence of mechanisms of action other than ACE inhibition. The paper also focuses on the technological aspects of the production of bioactive dairy products with antihypertensive peptides, either by fermentation with selected microorganisms or by in vitro-hydrolysis and enrichment. Finally, the stability of the peptides during production and processing is addressed, including the potential interactions with other food components and their influence on peptide bioactivity and bioavailability.
Keywords: Milk proteins; Bioactive peptides; Angiotensin-converting enzyme; Antihypertensive; Bioavailability; Fermentation; Proteolysis; Enrichment; Stability

Anne Pihlanto, Antioxidative peptides derived from milk proteins, International Dairy Journal, Volume 16, Issue 11, Technological and Health Aspects of Bioactive Components of Milk, Technological and Health Aspects of Bioactive Components of Milk, November 2006, Pages 1306-1314, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2006.06.005.
(http://www.sciencedirect.com/science/article/B6T7C-4KNMB0V-1/2/e09b72111a4c13e459b33c95e850c0ce)
Abstract:
Antioxidants may function by preventing the formation of radicals or by scavenging radicals or hydrogen peroxide and other peroxides. Milk contains several antioxidant factors, like vitamins and enzymes. Possible antioxidant activity of milk proteins and hydrolysates has also been shown. Peptides generated from the digestion of milk proteins are reported to have antioxidative activities. Milk-derived antioxidative peptides are composed of 5-11 amino acids including hydrophobic amino acids, proline, histidine, tyrosine or tryptophan in the sequence. The structure-activity relationship or the antioxidant mechanism of peptides is not fully understood. Antioxidant activity of the hydrolysates seems to be inherent to the characteristic amino acid sequences of peptides derived, depending on the protease specificity. The results suggest that the hydrolysates from milk proteins could be used as natural antioxidants in enhancing antioxidant properties of functional foods and in preventing oxidation reaction in food processing. Further studies are needed to elucidate the role of antioxidative peptides in the protective function in humans.
Keywords: Antioxidant activity; Milk protein; Hydrolysates; Peptides

Marius Collomb, Alexandra Schmid, Robert Sieber, Daniel Wechsler, Eeva-Liisa Ryhanen, Conjugated linoleic acids in milk fat: Variation and physiological effects, International Dairy Journal, Volume 16, Issue 11, Technological and Health Aspects of Bioactive Components of Milk, Technological and Health Aspects of Bioactive Components of Milk, November 2006, Pages 1347-1361, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2006.06.021.
(http://www.sciencedirect.com/science/article/B6T7C-4KSD5B0-1/2/e9a2d376b2ab4d634c6ac9c56177dcc8)
Abstract:
Much attention has been directed toward conjugated linoleic acid (CLA) since the discovery of its anticarcinogenic properties two decades ago. Many other biological activities have been reported over the past few years confirming that individual CLA isomers present in milk fat have a high health promoting potential. Its possible use in functional dairy products explains the increasing interest of the food industry in CLA research. Recent advances in the analytical methodology offer new possibilities to study the individual effects of the various isomers in biological systems. The aim of this review is to summarize the current knowledge in CLA research including the formation of CLA in cows, analysis of CLA isomers, factors influencing the CLA content in milk, processing of CLA-enriched milk and dairy products, as well as aspects concerning nutrition and health.
Keywords: CLA; Milk fat; Variation; Formation

Lynette M. Johnston, Lee-Ann Jaykus, Deborah Moll, Juan Anciso, Brenda Mora, Christine L. Moe, A field study of the microbiological quality of fresh produce of domestic and Mexican origin, International Journal of Food Microbiology, Volume 112, Issue 2, 1 November 2006, Pages 83-95, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.05.002.
(http://www.sciencedirect.com/science/article/B6T7K-4M3J0HW-1/2/4198b5176c7c95571e518628295e1fbe)
Abstract:
Produce is responsible for an increasingly larger proportion of foodborne disease outbreaks. In particular, the globalization of the food supply may introduce new food safety risks and allow widespread distribution of contaminated food, particularly produce. The objectives of this study were to: (i) compare the overall quality of domestic and Mexican produce throughout the packing process; (ii) examine changes in microbiological quality of both domestic and Mexican produce at each stage of production and processing; and (iii) evaluate the prevalence of select pathogens on fresh produce, including leafy green, herbs, melons, and vegetables. Furthermore, we also sought to characterize the antibiotic resistance profiles of Enterococcus faecium and Enterococcus faecalis strains isolated from fresh produce. A total of 466 produce and matching environmental swab samples was collected from various locations in packing sheds in the southern US from November 2002 through December 2003. These samples were assayed by enumerative tests for total aerobic bacteria (APC), total coliforms, total Enterococcus, and E. coli. Produce samples were also analyzed for the presence of Salmonella, Listeria monocytogenes, Shigella, and E. coli O157:H7. A total of 112 E. faecium and E. faecalis isolates were further screened for antibiotic resistance using a panel of seventeen antibiotics. Overall, the microbiological quality of fresh produce ranged from 4.0 to 7.9 log10 CFU/g (APC); less than 1.0 log10 to 4.5 log10 CFU/g (coliforms); less than 1.0 log10 to 4.0 log10 CFU/g (E. coli); and less than 1.0 log10 to 5.4 log10 CFU/g (Enterococcus). No Salmonella, Shigella, or E. coli O157:H7 were detected from the 466 25-g produce samples tested. However, three domestic cabbage samples were found to be positive for L. monocytogenes. Of the Enterococcus isolates, E. faecium had a higher degree of resistance to antibiotics in general, while Enterococcus spp. isolated from Mexican produce had a higher degree of antibiotic resistance when compared to strains isolated from produce samples of domestic origin. Despite increased attention to the role of imported produce in foodborne disease, this study does not support the assumption that domestic produce is of higher microbial quality than Mexican produce.
Keywords: Produce; Microbiological indicators; Food safety; Cantaloupe; Enterococcus; Antibiotic resistance

Norval J.C. Strachan, Geoffrey M. Dunn, Mary E. Locking, Thomas M.S. Reid, Iain D. Ogden, Escherichia coli O157: Burger bug or environmental pathogen?, International Journal of Food Microbiology, Volume 112, Issue 2, 1 November 2006, Pages 129-137, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.06.021.
(http://www.sciencedirect.com/science/article/B6T7K-4KRY3GW-2/2/5871755d3624b517dc2a3864a570d9ed)
Abstract:
The three main pathways of Escherichia coli O157 infection are foodborne, environmental (including direct contact with animals and their faeces and contaminated water supplies) or person to person contact. The disease is often nicknamed the `burger bug' but it appears that environmental risk factors may be more important. In this study we use four techniques (outbreak analysis, case-control studies, disease mapping and quantitative microbial risk assessment (QMRA)) to determine whether burgers or environmental pathways present the greater risk in Scotland. Analysis of E. coli O157 outbreaks in Scotland from 1994 to 2003 associated with either meat or dairy foods, or with environmental transmission shows that approximately 40% [M1] of these outbreaks were foodborne, 54% were environmental and 6% involved both transmission

routes. However, the largest outbreaks tend to be foodborne accounting for 83% of outbreak cases. Case-control studies indicate strong risk associations with environmental exposure in Scotland, the UK as a whole and the USA, but burgers appear to be more of a risk in the USA. Canadian, Scottish and Swedish disease mapping studies found positive association with indicators of cattle density. In Grampian (North-East Scotland) we found that there was a positive association with cattle and sheep density (divided by human population density) as well as percentage of population on private water supplies. We found 63% of cases in rural postcodes compared with 37% urban after correcting for population differences suggesting that at least 26% of cases may be classified as environmental. QMRA showed that on average, the risk was 100 times greater when visiting a pasture than eating a burger in Grampian. However, it is difficult to determine which pathway actually causes most illnesses as it is unknown how many burgers are consumed daily and what is the frequency of human visits to pasture. The implementation of hygienic food processing post-1996 Central Scotland outbreak and the preference for `well done' burgers may account for this food being a relatively low risk thus making the `burger bug' term less appropriate in the UK.
Keywords: Quantitative microbiological risk assessment; Epidemiology; Disease mapping; Escherichia coli O157; Infectious diseases; Environmental pathogens; Foodborne pathogens

John R.N. Taylor, Tilman J. Schober, Scott R. Bean, Novel food and non-food uses for sorghum and millets, Journal of Cereal Science, Volume 44, Issue 3, November 2006, Pages 252-271, ISSN 0733-5210, DOI: 10.1016/j.jcs.2006.06.009.
(http://www.sciencedirect.com/science/article/B6WHK-4KTVP06-1/2/05ae5a61e1f173057b395d8c1a1523b6)
Abstract:
Sorghum and millets have considerable potential in foods and beverages. As they are gluten-free they are suitable for coeliacs. Sorghum is also a potentially important source of nutraceuticals such antioxidant phenolics and cholesterol-lowering waxes. Cakes, cookies, pasta, a parboiled rice-like product and snack foods have been successfully produced from sorghum and, in some cases, millets. Wheat-free sorghum or millet bread remains the main challenge. Additives such as native and pre-gelatinised starches, hydrocolloids, fat, egg and rye pentosans improve bread quality. However, specific volumes are lower than those for wheat bread or gluten-free breads based on pure starches, and in many cases, breads tend to stale faster. Lager and stout beers with sorghum are brewed commercially. Sorghum's high-starch gelatinisation temperature and low beta-amylase activity remain problems with regard to complete substitution of barley malt with sorghum malt . The role of the sorghum endosperm matrix protein and cell wall components in limiting extract is a research focus. Brewing with millets is still at an experimental stage. Sorghum could be important for bioethanol and other bio-industrial products. Bioethanol research has focused on improving the economics of the process through cultivar selection, method development for low-quality grain and pre-processing to recover valuable by-products. Potential by-products such as the kafirin prolamin proteins and the pericarp wax have potential as bioplastic films and coatings for foods, primarily due to their hydrophobicity.
Keywords: Sorghum; Millet; Food; Bread; Malting; Brewing; Bioethanol; Gluten-free; Kafirin; Wax

Ch. Vial, Rajeev K. Thakur, G. Djelveh, L. Picgirard, Continuous manufacturing of a light-textured foamed fresh cheese by dispersion of a gas phase. I. Influence of process parameters, Journal of Food Engineering, Volume 77, Issue 1, November 2006, Pages 1-13, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.019.
(http://www.sciencedirect.com/science/article/B6T8J-4GV8STP-1/2/b3ade2aef820081a183dd484b0d6ed57)
Abstract:

A continuous process was developed for manufacturing a light-textured fresh cheese by dispersion and stabilization of a gas phase in form of tiny bubbles. This was carried out using a mechanically stirred column that simulates the behaviour of a scraped surface heat exchanger. The process performance was studied on the basis of overrun, stability over time and rheological properties of foamed products. This work focuses on the influence of process parameters, such as pH, total solids, curd homogenization, pasteurization temperature, rotation speed, as well as inlet and jacket temperatures. The optimization of process conditions enabled the manufacture of a stable product (more than 21 days) including at least 15% (v/v) air, even when pH was close to the pI of milk, which corresponds apparently to the lowest foaming ability of fresh cheese. Key parameters for successful operation were total solids and inlet temperature: optimal total solids stood between 36% and 38% (w/w), while the difference between inlet and jacket temperatures should be as high as possible, such as 80 [degree sign]C and 4 [degree sign]C, respectively, in order to maximize supercooling. Pressure homogenization at 200 bars played a positive role on foaming, whereas varying pasteurization temperature between 72 and 83 [degree sign]C had no effect on the properties of foamed fresh cheese. The optimal rotation speed was also shown to be strongly correlated to total solids.
Keywords: Continuous process; Foamability; Foam stability; Food processing; Fresh cheese; Gas dispersion; Texture

Da-Wen Sun, Progress on bioproducts processing and food safety, Journal of Food Engineering, Volume 77, Issue 2, Progress on Bioproducts Processing and Food Safety - Selected Papers from the 1st International Conference of CIGR Section VI on Bioproducts Processing and Food Safety, November 2006, Pages 201-202, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.024.
(http://www.sciencedirect.com/science/article/B6T8J-4GTW8HV-7/2/ce73a11cbd3f5a8418eb3335a3f73331)

Da-Wen Sun, Liyun Zheng, Vacuum cooling technology for the agri-food industry: Past, present and future, Journal of Food Engineering, Volume 77, Issue 2, Progress on Bioproducts Processing and Food Safety - Selected Papers from the 1st International Conference of CIGR Section VI on Bioproducts Processing and Food Safety, November 2006, Pages 203-214, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.023.
(http://www.sciencedirect.com/science/article/B6T8J-4GV8STP-3/2/4872c48faf76a2f8a1b72e8941d2296f)
Abstract:
The principle of vacuum cooling is based on rapid evaporation of part of the moisture of the product under vacuum. Vacuum cooling can be used to shorten processing time, extend product shelf life, and improve product quality and safety. Traditionally, vacuum cooling is used in the agricultural industry to pre-cool leafy vegetables and mushroom in order to rapidly remove field heats. Recently, vacuum cooling has been applied to cool viscous food products and bakery products in the food industry, and tuna in the fish industry.
Food safety concern has driven cooked meat manufacturers to explore new method to reduce cooling time, which has consequently led to a comprehensive research study of vacuum cooling of large cooked meat joints in the past few years including mathematical modelling of the vacuum cooling process using finite element method and computational fluid dynamics (CFD), especially thorough research work has been carried out by the Food Refrigeration and Computerised Food Technology (FRCFT) Research Group in National University of Ireland. Currently, research studies on vacuum cooling of ready meal components have also been conducted in FRCFT Research Group.
This paper first discusses the principles and equipment of vacuum cooling and critically analyses the advantages and disadvantages of this technique. Much effort is then spent on reviewing the development of this technology for the agri-food industry, in particularly, the latest research results

from the FRCFT Research Group, which have carried out extensive research work since 1997 funded by the Non-Commissioned Food Research Programme and the Food Institutional Research Measures administered by the Irish Government Department of Agriculture and Food. Future prospects of research and development of vacuum cooling technology is finally addressed.
Keywords: Vacuum cooling; Rapid cooling; Chilling; Refrigeration; Air blast chilling; Water immersion chilling; Cooked meat; Ham; Beef joints; Weight loss; Vegetables; Bakery; Cut flower; Lettuce; Mushroom; Ready meals; Cooling rate; Food quality; Food safety; Mathematical modelling; Simulation

Ch. Vial, Rajeev K. Thakur, A. Perez Quintans, G. Djelveh, L. Picgirard, Continuous manufacturing of a light-textured foamed fresh cheese by dispersion of a gas phase. II. Influence of formulation, Journal of Food Engineering, Volume 77, Issue 1, November 2006, Pages 14-26, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.016.
(http://www.sciencedirect.com/science/article/B6T8J-4GTW8HV-3/2/7501d623658004253a53394ef8da5321)
Abstract:
The continuous process developed in 'Part I. Influence of process parameters' was used to investigate the influence of ingredients on the manufacturing of a light-textured foamed fresh cheese. The role of ingredients was analyzed using overrun, stability of the dispersed gas phase over time, cheese texture and visual aspect as indicators. Using cream and skim milk as a reference, fresh cheese formulation has been modified by replacing cream with milk fat fractions or incorporating whey protein concentrates (WPC) and emulsifiers, such as phospholipids (PhL) and mono-diglycerides (MDG). Experiments have shown that the foamability and the stability are enhanced by WPC addition and high-melting point fat fractions, but also that the simultaneous addition of WPC and PhL provides softer textures, whereas MDG present always a negative impact on foamability. The best results are obtained when WPC are incorporated before curd homogenization.
Keywords: Fresh cheese; Continuous process; Foamability; Foam stability; Formulation; Food processing; Gas dispersion; Texture

B.M. McKenna, J. Lyng, N. Brunton, N. Shirsat, Advances in radio frequency and ohmic heating of meats, Journal of Food Engineering, Volume 77, Issue 2, Progress on Bioproducts Processing and Food Safety - Selected Papers from the 1st International Conference of CIGR Section VI on Bioproducts Processing and Food Safety, November 2006, Pages 215-229, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.052.
(http://www.sciencedirect.com/science/article/B6T8J-4H2PJ9J-1/2/7cdb137c41b6ca87dffebe95ee10e7d9)
Abstract:
Interest in both radio frequency (RF) and ohmic heating of foods has increased in recent years. In particular, their application to meat products has been investigated. A critical factor is the dielectric constants of the products being heated. These have been measured for meats. In particular, the dielectric constant [epsilon]', dielectric loss factor [epsilon]'', thermal heat capacity cp, thermal conductivity k and thermal diffusivity [alpha] of two local comminuted meat products of differing diameters, both pork based, (pork luncheon roll PLR and white pudding WP) were measured between 5 and 85 [degree sign]C. Radio frequency (RF) and microwave (MW) [epsilon]'' values varied across 5-85 [degree sign]C ($P < 0.05$). Microwave [epsilon]' and [epsilon]'' values for WP tended to peak at 45 [degree sign]C and decrease thereafter, whereas for PLR, [epsilon]' and [epsilon]'' peaked at 65 [degree sign]C which appeared to match potato starch gelatinisation within this product. WP and PLR had significantly higher cp values at 25 [degree sign]C, which corresponded to the melting point of pork fat. At 85 [degree sign]C, k values were higher ($P <$

0.05) than at 5, 25 and 45 [degree sign]C but were not higher than values at 65 [degree sign]C. Thermal diffusivity [alpha] values increased with temperature ($P < 0.05$).
For ohmic heating, the electrical conductivity becomes the controlling variable. Efficacy of ohmic processing can be influenced by the conductivities of individual components within the food and their behaviour and interactions during the heating process. Conductivity measurements on pork cuts indicated that lean is highly conductive compared to fat and addition of fat to lean reduced the overall conductivity but the addition of fat over the range (i.e. 0-100%) was non-linear. Light microscopy suggested that differences in the conductivities of leg and shoulder lean (entire) (0.76 vs. 0.64 S m-1, respectively) could be due to the denser muscle fibre structure and/or higher intra-muscular fat in the shoulder vs. the leg meat. This could be of significance for ohmic processing of full muscle products.
Of course, for both forms of heating, the quality of the heated product becomes the critical factor. The effect of radio frequency cooking, on the quality (assessed by cook yield, water holding capacity texture profile analysis, penetration test, Warner-Bratzler shear, colour and sensory evaluation) and cooking time of two types of pork products (leg ham and shoulder ham) were compared to steam cooked samples. RF cooking of the hams resulted in a shorter cooking time. Instrumental measurements indicated that RF heated samples had a higher cook yield ($P < 0.05$), but a lower water holding capacity ($P < 0.05$). Texture profile analysis indicated that RF cooked samples were harder ($P < 0.05$), particularly for leg hams. A sensory panel also indicated that panellists could distinguish between radio frequency and steam cooked samples ($P < 0.05$).
Keywords: Ohmic; Radio frequency; Heating; Comminuted pork

D.C. Voit, M.R. Santos, R. Paul Singh, Development of a multipurpose fruit and vegetable processor for a manned mission to Mars, Journal of Food Engineering, Volume 77, Issue 2, Progress on Bioproducts Processing and Food Safety - Selected Papers from the 1st International Conference of CIGR Section VI on Bioproducts Processing and Food Safety, November 2006, Pages 230-238, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.035.
(http://www.sciencedirect.com/science/article/B6T8J-4GVGT81-5/2/995e0e6046a7e6637d81d75a87900617)
Abstract:
Current plans for long duration space missions anticipate the need for self-sustaining habitats, which would include plants for food and atmospheric reprocessing. Growth of food, in turn, necessitates a food processing element. A multipurpose fruit and vegetable processor (MFVP) was designed and built for this purpose by comparing potential technologies using equivalent system mass (ESM) impact, a NASA metric. As an example of selection and evaluation, the concentration sub-unit to produce tomato concentrate is reviewed. Evaporation, and integrated membrane approaches--microfiltration (MF), ultrafiltration (UF) and reverse osmosis (RO)--were compared for applicability. Direct RO was selected and tests evaluated operating conditions, maximum concentration and flux decline. Filtration performance parameters were obtained: permeate flux, volume concentration factor (VCF) and power usage. Pressure and temperature were the determining factors in performance and a maximum concentrate of 22.7 [degree sign]Brix was projected. Increases in cross-flow velocity (CFV) added power demand and therefore was found to raise ESM. Added transmembrane pressure (TMP), on the other hand was found to offset power increases by reducing processing time. The study validated the use of ESM as a tool for selecting technologies and proved the usability of RO for the MFVP process.
Keywords: Tomato; Membrane; Reverse osmosis; Equivalent system mass; NASA

Tat Hean Gan, Prakash Pallav, David A. Hutchins, Non-contact ultrasonic quality measurements of food products, Journal of Food Engineering, Volume 77, Issue 2, Progress on Bioproducts Processing and Food Safety - Selected Papers from the 1st International Conference of CIGR

Section VI on Bioproducts Processing and Food Safety, November 2006, Pages 239-247, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.026.
(http://www.sciencedirect.com/science/article/B6T8J-4GTVYBH-7/2/f441cc09adda81919cf1bc82cf1c9c20)
Abstract:
This paper describes the application of a non-contact ultrasonic system to food inspection, using electrostatic transducers and signal processing techniques. The system, which operates in through-transmission mode, is used to detect physiochemical changes and density variations in food. One application is to monitor coagulation processes, caused by destabilization in milk-based products. It is shown that the amplitude of the signal varies with time after the pH of such samples was lowered, resulting in destabilisation. Various types of samples of different pH values were used in order to illustrate that the air-coupled system was sensitive to such changes. Non-contact imaging has also been performed to follow this process, during which gel formation could be identified. In addition, changes in oil properties due to temperature variations have also been measured using the non-contact system. The measurements can be achieved without contact to the test samples, and thus has the potential for the rapid inspection of various types of food products.
Keywords: Non-contact ultrasound; Agglomeration; Coagulation; Crystallisation

Frank P. Cuozzo, Michelle L. Sauther, Severe wear and tooth loss in wild ring-tailed lemurs (Lemur catta): A function of feeding ecology, dental structure, and individual life history, Journal of Human Evolution, Volume 51, Issue 5, November 2006, Pages 490-505, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2006.07.001.
(http://www.sciencedirect.com/science/article/B6WJS-4KDBFRG-1/2/783b956da672fb39bcf6b1fe19b4836c)
Abstract:
The ring-tailed lemurs at Beza Mahafaly Special Reserve, Madagascar, exhibit a high frequency of severe wear and antemortem tooth loss. As part of a long-term study, we collected dental data on 83 living adult ring-tailed lemurs during 2003 and 2004. Among these individuals, 192 teeth were scored as absent. The most frequently missing tooth position is M1 (24%). As M1 is the first tooth to erupt, its high frequency of absence (primarily a result of wear) is not remarkable. However, the remaining pattern of tooth loss does not correlate with the sequence of eruption. We suggest that this pattern is a function of 1) feeding ecology, as hard, tough tamarind fruit is a key fallback food of ring-tailed lemurs living in gallery forests; 2) food processing, as tamarind fruit is primarily processed in the P3-M1 region of the mouth; and 3) tooth structure, as ring-tailed lemurs possess thin dental enamel. The incongruity between thin enamel and use of a hard, tough fallback food suggests that ring-tailed lemurs living in riverine gallery forests may rely on resources not used in the past. When comparing dental health in the same individuals (n = 50) between 2003 and 2004, we found that individual tooth loss can show a rapid increase over the span of one year, increasing by as much as 20%. Despite this rapid loss, individuals are able to survive, sometimes benefiting from unintentional assistance from conspecifics, from which partially processed tamarind fruit is obtained. Although less frequent in this population, these longitudinal data also illustrate that ring-tailed lemurs lose teeth due to damage and disease, similar to other nonhuman primates. The relationship between tooth loss, feeding ecology, dental structure, and individual life history in this population has implications for interpreting behavior based on tooth loss in the hominid fossil record.
Keywords: Tooth wear; Dental pathology; Hominid paleobiology; Propithecus; Primate

Len Marquart, Anh-Tram Pham, Lauren Lautenschlager, Michael Croy, Jeffery Sobal, Beliefs about Whole-Grain Foods by Food and Nutrition Professionals, Health Club Members, and Special Supplemental Nutrition Program for Women, Infants, and Children Participants/State Fair

Attendees, Journal of the American Dietetic Association, Volume 106, Issue 11, November 2006, Pages 1856-1860, ISSN 0002-8223, DOI: 10.1016/j.jada.2006.08.005.
(http://www.sciencedirect.com/science/article/B758G-4M9NHJD-W/2/bddaf9de27493de1abdef676f013ebab)
Abstract:
Whole-grain foods are important components of healthful diets that may help prevent chronic diseases. Consumer beliefs that influence consumption of whole grains are poorly understood. This analysis surveyed three groups regarding their beliefs about whole-grain foods. The groups were food and nutrition professionals (n=103), health club members (n=103), and individuals representing various consumer segments of the general population, including participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and state fair attendees (n=68). Most respondents were aware of the term whole-grain foods, but less often reported that they use the term. Bread and cereal were most often named as examples of whole-grain foods. Lack of processing and use of the entire grain were the major reasons a food was perceived as being a whole-grain food. The major benefit of eating whole grains was reported to be fiber intake. Food and nutrition professionals provided more differentiated responses, whereas WIC/state fair participants had fewer and less elaborate responses. Assessing beliefs about whole grains offers insights to nutrition professionals for encouraging healthful food consumption.

Jean-Michel Le Quere, Francois Husson, Catherine M.G.C. Renard, Jo Primault, French cider characterization by sensory, technological and chemical evaluations, LWT - Food Science and Technology, Volume 39, Issue 9, European Symposium on Apple Processing, November 2006, Pages 1033-1044, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.02.018.
(http://www.sciencedirect.com/science/article/B6WMV-4JKYWR9-1/2/fa0b7b9cbb4a6c80321df95f716310c0)
Abstract:
A set of 90 ciders among them 50 'brut' (near dry), 30 'demi-sec' (half dry) and 10 'doux' (sweet) were collected and analysed to get a data base of about 180 variables including processing conditions, sensory descriptors and physicochemical variables. This data set was treated by a multiple factor analysis (MFA) using the sensory and analytical data as active variables whereas the 'processing conditions' data were introduced as illustrative variables. Two MFAs was carried out separating the less sweet ('bruts') from the sweeter ('demi secs' and 'doux') ciders. For both sets, the MFAs showed a strong polarization of the ciders characteristics: fruity/flowery flavours are associated with cooked flavours and opposed to the descriptors 'animal' (animal), 'sous-bois' (underwood), 'fond de cuve' (vat dregs) themselves associated with bitterness and astringency and also 'pomme/cidre' (cider/apple) flavours. The industrial ciders located on axis 1 near the fruity and cooked odours whereas the ciders of small scale producers were close to the second group of flavours and tastes.
Keywords: Alcoholic beverages; Fermented products; Analytical data; Food composition; Multivariate analysis

M.V. Flyman, A.J. Afolayan, The suitability of wild vegetables for alleviating human dietary deficiencies, South African Journal of Botany, Volume 72, Issue 4, November 2006, Pages 492-497, ISSN 0254-6299, DOI: 10.1016/j.sajb.2006.02.003.
(http://www.sciencedirect.com/science/article/B7XN9-4KGG4GP-2/2/645e6307c9c7413072a1bfbbfd0cc889)
Abstract:
Micronutrient deficiency is a universal problem, which presently affects over two billion people worldwide, resulting in poor health, low worker productivity, high rates of mortality and morbidity. Deficiency in micronutrients has led to increased rates of chronic diseases and permanent impairment of cognitive abilities in infants born to micronutrient deficient mothers. Wild vegetables

have been the mainstay of human diets for centuries, providing millions of consumers with important micronutrients, such as vitamins and minerals needed to maintain health and promote immunity against infections. Compared to conventional cultivated species, wild vegetables are hardy, require less care, and are a rich source of micronutrients. Hence, they could make an important contribution to combating micronutrient malnutrition as well as providing food security. Unfortunately, wild vegetables are currently underutilized, and have been neglected by researchers and policy makers. Their promotion and integration into human diets could assist in their protracted use and consequent conservation. However, the chemical, nutritional and toxicological properties of especially local wild vegetables, the bioavailability of micronutrients present in these, and their modification by various processing techniques still need to be properly established and documented before their use as an alternative dietary source can be advocated. Such information would be of fundamental importance in addressing dietary deficiencies in impoverished African rural communities.
Keywords: Wild vegetables; Micronutrients; Bioavailability; Food processing

Bernd Linke, Kinetic study of thermophilic anaerobic digestion of solid wastes from potato processing, Biomass and Bioenergy, Volume 30, Issue 10, October 2006, Pages 892-896, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2006.02.001.
(http://www.sciencedirect.com/science/article/B6V22-4JMVHM4-1/2/21d626d8feacbc587c682d2f342af181)
Abstract:
Anaerobic treatment of solid wastes from potato processing was studied in completely stirred tank reactors (CSTR) at 55 [degree sign]C. Special attention was paid to the effect of increased organic loading rate (OLR) on the biogas yield in long-term experiments. Both biogas yield and CH4 in the biogas decreased with the increase in OLR. For OLR in the range of 0.8 gl-1 d-1-3.4 gl-1 d-1, biogas yield and CH4 obtained were 0.85 l g-1-0.65 l g-1 and 58%-50%, respectively. Biogas yield y as a function of maximum biogas yield ym, reaction rate constant k and HRT are described on the basis of a mass balance in a CSTR and a first order kinetic. The value of ym can be obtained from curve fitting or a simple batch test and k results from plotting y/(ym-y) against 1/OLR from long-term experiments. In the present study values for ym and k were obtained as 0.88 l g-1 and 0.089 d-1, respectively. The simple model equations can apply for dimensioning completely stirred tank reactors (CSTR) digesting organic wastes from food processing industries, animal waste slurries or biogas crops.
Keywords: Anaerobic digestion; Thermophilic; CSTR; Biogas; Potato wastes; Kinetic model

Laila Ali, Farukh Khambaty, Gregory Diachenko, Investigating the suitability of the Calgary Biofilm Device for assessing the antimicrobial efficacy of new agents, Bioresource Technology, Volume 97, Issue 15, October 2006, Pages 1887-1893, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.08.025.
(http://www.sciencedirect.com/science/article/B6V24-4HDG9B1-2/2/835a2539edd036c628b40d28df73b43f)
Abstract:
This study investigated the suitability of the Calgary Biofilm Device (CBD), originally designed as a test surrogate for indwelling medical devices, for assessing the efficacy of antimicrobials developed for food and food contact surface disinfection applications. The conditions for the development of uniform biofilms from pure and mixed bacterial cultures of wild type Escherichia coli and Listeria innocua were optimized. We were able to recover [approximate]2 x 106 colony forming units (CFU) from the biofilms formed on the individual pegs of the device in 24 h. Further, the parameters for the consistent release of the cells from the biofilms were optimized; test showed that the number of cells released was uniform and reproducible. The consistency and reproducibility of the biofilms formed on the pegs was evaluated using scanning electron

microscopy and by plate count method. The efficacies of disinfectants on cells residing in biofilms versus planktonic cells were compared. For both species, higher concentrations of disinfectants were needed to eliminate attached cells as compared with planktonic cells. This study establishes the value of the CBD for generating consistent biofilms from either pure or mixed cultures. These biofilms can be used to assess efficacies of disinfectants against cells that have colonized the surfaces of foods and food-processing equipment. Such a system could serve as a standard surrogate for evaluating new disinfectants designed to reduce or eliminate biofilms from food-contact surfaces.
Keywords: Biofilms; Calgary Biofilm Device; Planktonic cells; Disinfectants; Escherichia coli; Listeria innocua

D.I. Akaaimo, A.O. Raji, Some Physical and Engineering Properties of Prosopis africana seed, Biosystems Engineering, Volume 95, Issue 2, October 2006, Pages 197-205, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2006.06.005.
(http://www.sciencedirect.com/science/article/B6WXV-4KR3JDC-1/2/cb18373b4547aafcd86075c0218bf5bb)
Abstract:
Prosopis africana (Iron tree) is a popular tree in the Sub-Saharan Africa with all the parts used for food and medicinal purposes. The seed which has to be extracted from the pod is the most widely used. This study focused on the determination of some physical and engineering properties of the seed. This is with a view to obtaining data useful in machine design for handling and processing of the seeds especially decortication which is presently done manually. One thousand seed weight was obtained as 199[middle dot]80 g, while the bulk and true densities were found to be 899[middle dot]67 and 1397[middle dot]10 kg m-3, respectively. The volume, angle of repose, geometric mean diameter, sphericity and porosity were 0[middle dot]14 cm3, 22[middle dot]3[degree sign], 6[middle dot]43, 0[middle dot]65 and 35[middle dot]6%. The coefficient of internal friction for the seeds was 0[middle dot]31, while the coefficient of friction on plywood, mild steel sheet and galvanized sheet were 0[middle dot]32, 0[middle dot]30 and and 0[middle dot]23. These data are useful in the design and development of handling and processing machines, which are not available currently in literature.

Laurent Guillier, Jean-Christophe Augustin, Modelling the individual cell lag time distributions of Listeria monocytogenes as a function of the physiological state and the growth conditions, International Journal of Food Microbiology, Volume 111, Issue 3, 1 October 2006, Pages 241-251, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.05.011.
(http://www.sciencedirect.com/science/article/B6T7K-4KF780K-2/2/5321065b68427e60f325978f99119504)
Abstract:
The individual cell lag time distributions of Listeria monocytogenes were characterized for 54 combinations of 22 initial physiological states, 18 growth conditions, and 11 strains. The individual cell lag times were deduced from the times for cultures issued from individual cells to reach an optical density threshold. The extreme value type II distribution with a shape parameter set to 5 was shown effective to describe the 54 observed distributions. The theoretical distributions of individual lag times were thus predictable from the observed means and standard deviations of cell lag times. More interestingly, relationships were proposed to predict the mean and the standard deviation of individual cell lag times from population lag times observed with high initial concentration experiments. The observed relations are consistent with the constancy of the product of the growth rate by the lag time at the cell level for a given physiological state when growth conditions are varying. This product, k, is thus representative of the cell physiological state. The proposed models allow the prediction of individual cell lag time distributions of L. monocytogenes in different growth conditions. We also observed that, whatever the stress

encountered and the strains used, the coefficient of variation of the distributions of k was quite constant.
These results could be used to describe the variability of the behaviour of few cells of L. monocyotgenes contaminating foods and stressed in the environment of food industry or by food processing.
Keywords: Predictive microbiology; Listeria monocytogenes; Individual cell lag time; Stochastic growth modelling

Susana Rodriguez Couto, M Angeles Sanroman, Application of solid-state fermentation to food industry--A review, Journal of Food Engineering, Volume 76, Issue 3, October 2006, Pages 291-302, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.05.022.
(http://www.sciencedirect.com/science/article/B6T8J-4GNTFC5-1/2/0bc7b61c7649ce0e71e8d9decd1eb398)
Abstract:
Solid state fermentation (SSF) has become a very attractive alternative to submerged fermentation (SmF) for specific applications due to the recent improvements in reactor designs. This paper reviews the application of SSF to the production of several metabolites relevant for the food processing industry, centred on flavours, enzymes ([alpha]-amylase, fructosyl transferase, lipase, pectinase), organic acids (lactic acid, citric acid) and xanthan gum. In addition, different types of biorreactor for SSF processes have been described.
Keywords: Bioreactors; Enzyme production; Food processing industry; Solid-state fermentation

P. Nisha, Rekha S. Singhal, Aniruddha B. Pandit, Kinetic modelling of texture development in potato cubes (Solanum tuberosum L.), green gram whole (Vigna radiate L.) and red gram splits (Cajanus cajan L.), Journal of Food Engineering, Volume 76, Issue 4, October 2006, Pages 524-530, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.05.054.
(http://www.sciencedirect.com/science/article/B6T8J-4GSTRYJ-3/2/3c8556a92b382c5b9df5a2ffc260c1e5)
Abstract:
Texture is one of the most important quality parameter, which influences the acceptability of food products. The kinetics of texture development which was evaluated using a Stevens-LFRA Texture Analyzer in terms load in grams, has been studied over a temperature range of 50-120 [degree sign]C (isothermal process), and also during normal open pan cooking, pressure-cooking and a cooking in a newly developed and patented fuel-efficient `EcoCooker' (non-isothermal heating process). The texture development followed first order kinetics in potato cubes, whole green gram and red gram splits, the food samples used in this study. A mathematical model was developed using the rate constants of texture development at fixed temperatures and the time-temperature profile of the processing method.
Keywords: Texture; Kinetics; Cookers

Anna Fritzson, Thore Berntsson, Efficient energy use in a slaughter and meat processing plant--opportunities for process integration, Journal of Food Engineering, Volume 76, Issue 4, October 2006, Pages 594-604, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.06.007.
(http://www.sciencedirect.com/science/article/B6T8J-4GWJ879-1/2/20d00daf06c6d5ae44223ade7adcb89d)
Abstract:
In this paper, process integration methods are used to investigate the potential to decrease the energy usage in the slaughtering and meat processing industry. Above ambient temperatures, heating of water with different target temperatures is a large heat demand in a plant, while at subambient temperatures the refrigeration plant needs almost all of the shaftwork used at the site. Interaction between, on one hand, energy demands above ambient temperature and, on the other,

cooling needs below ambient temperature can take place with freezing compressors or heat pumps. By using process integration methods above and below ambient temperatures, potentials for saving both shaftwork and external heat demand in food plants can be identified. A case study at a modern plant illustrates that even though many energy-saving measures have been taken there is still a technical potential for saving 30% of the external heat demand and more than 10% of the shaftwork used in the plant. The economic potential for the savings is dependent on the conditions at the plant.
Keywords: Process integration; Ready-made meals; Pinch analysis; Energy savings; Food processing; Slaughterhouse; Meat processing; Shaftwork; Refrigeration; Heat pump

Kavita M. Tarade, Rekha S. Singhal, Radha V. Jayram, Aniruddha B. Pandit, Kinetics of degradation of saponins in soybean flour (Glycine max.) during food processing, Journal of Food Engineering, Volume 76, Issue 3, October 2006, Pages 440-445, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.05.044.
(http://www.sciencedirect.com/science/article/B6T8J-4GP1V5W-7/2/62ebf02ce8f508279a05f13b69fe0e4d)
Abstract:
Saponin glycosides present in a wide variety of plants have the ability to haemolyse red blood cells. They are known to be relatively heat stable. The present study aims at the development of a kinetic model for degradation of saponins in soybean flour (Glycine max.) subjected to a defined set of processing conditions. This study was carried out at isothermal conditions over a temperature range of 80-130 [degree sign]C, and also under nonisothermal conditions in three different cooking methods viz., open pan, pressure cooking and cooking in a recently developed and patented fuel efficient `EcoCooker'. The degradation of saponins was adequately modeled by the Arrhenius equation. Using the time-temperature data of the nonisothermal heat process and isothermal kinetic rate parameters, a mathematical model has been developed to predict the degradation of saponins in any nonisothermal heating process of known time-temperature profiles.
Keywords: Saponins; Degradation; Kinetics; Soybean; Cookers

S. Rajan, S. Pandrangi, V.M. Balasubramaniam, A.E. Yousef, Inactivation of Bacillus stearothermophilus spores in egg patties by pressure-assisted thermal processing, LWT - Food Science and Technology, Volume 39, Issue 8, October 2006, Pages 844-851, ISSN 0023-6438, DOI: 10.1016/j.lwt.2005.06.008.
(http://www.sciencedirect.com/science/article/B6WMV-4GR8NDW-2/2/718e2a0d63b018a63adaa51431ca469a)
Abstract:
The use of pressure-assisted thermal processing (PATP) to inactivate bacterial spores in shelf-stable low-acid foods, without diminishing product quality, has received widespread industry interest. Egg patties were inoculated with Bacillus stearothermophilus spores (106 spores/g) and the product was packaged in sterile pouches by heat sealing. Test samples were preheated and then PATP-treated at 105 [degree sign]C at various pressures and pressure-holding times. Thermal inactivation of spores was studied at 121 [degree sign]C using custom-fabricated aluminum tubes; this treatment served as a control. Application of PATP at 700 MPa and 105 [degree sign]C inactivated B. stearothermophilus spores, suspended in egg matrix rapidly, (4 log reductions in 5 min) when compared to thermal treatment at 121 [degree sign]C (1.5 log reduction in 15 min). Spore inactivation by PATP progressed rapidly (3 log reductions at 700 MPa and 105 [degree sign]C) during pressure-hold for up to 100 s, but greater holding times (up to 5 min) had comparatively limited effect. When PATP was applied to spores in water suspension or egg patties, D values were not significantly different. While thermal inactivation of spores followed first-order kinetics, PATP inactivation exhibited nonlinear inactivation kinetics. Among the nonlinear

models tested, the Weibull model best described PATP inactivation of B. stearothermophilus spores in the egg product.
Keywords: Pressure-assisted thermal processing; Shelf-stable foods; Bacillus stearothermophilus; Egg; Weibull model

Ascension Martinez-Sanchez, Ana Allende, Richard N. Bennett, Federico Ferreres, Maria Isabel Gil, Microbial, nutritional and sensory quality of rocket leaves as affected by different sanitizers, Postharvest Biology and Technology, Volume 42, Issue 1, October 2006, Pages 86-97, ISSN 0925-5214, DOI: 10.1016/j.postharvbio.2006.05.010.
(http://www.sciencedirect.com/science/article/B6TBJ-4KV2RKJ-1/2/52dc65c3dd4ebc96277d190032de0706)
Abstract:
Leafy salad species are increasingly consumed in the human diet and there is increased concern about the levels of microbial organisms in these raw foods, and especially bacteria such as Salmonella that cause food poisoning. Various chemical sanitizers therefore are used to control microorganisms and fungi, but there is very little information on the effects of these chemicals on food composition. Wild rocket (Diplotaxis tenuifolia L. DC) leaves were washed using tap water, chlorine (100 mg L-1), ozonated water (10 mg L-1), lactic acid (Purac(R) 20 mL L-1), acidified sodium chlorite (Sanova(R) 250 mg L-1) and peroxyacetic acid (Tsunami(R) 300 mg L-1). The effects of sanitizers on the contents of Vitamin C, polyphenols and glucosinolates of rocket leaves were studied under air and low O2 (1-3 kPa) + high CO2 (11-13 kPa) for 15 days at 4 [degree sign]C. All the sanitizers effectively reduced microbial growth on the day of processing, but only Purac, Tsunami and Sanova inhibited the microbial growth throughout the shelf life. The visual quality was acceptable for all treatments in air while it was poor under low O2 + high CO2. In addition, Purac was particularly detrimental for sensory quality. Both chlorophyll a and chlorophyll b contents were reduced throughout storage but were independent of washing treatments and storage conditions. The content of vitamin C was maintained for up to 8 days of storage under air and low O2 + high CO2, but Purac washes markedly reduced the vitamin C content. A clear decrease in ascorbic acid followed by an increase in dehydroascorbic acid was observed when samples were stored under low O2 + high CO2. The content of flavonoids was not affected by the washing solutions on the processing day and remained almost constant throughout the storage in air. However, marked reductions were observed when samples were stored under low O2 + high CO2. The glucosinolates were the most affected constituents of rocket leaves as the content was reduced from 4 to 33% when samples were stored in air while the decrease was between 60 and 100% in low O2 + high CO2. These data revealed that Sanova and Tsunami could be alternative sanitizers to chlorine for rocket leaf washes due to good retention of sensory quality with no detrimental reduction of the antioxidant constituents.
Keywords: Diplotaxis tenuifolia L.; Salad vegetables; Polyphenols; Vitamin C; Ascorbic acid; Glucosinolates; Phytonutrients; Chlorine; Ozone; Lactic acid; Peroxyacetic acid; Bacterial growth

Frank E. Coman, Rod M. Connolly, Stuart E. Bunn, Nigel P. Preston, Food sources of the sergestid crustacean, Acetes sibogae, in shrimp ponds, Aquaculture, Volume 259, Issues 1-4, 8 September 2006, Pages 222-233, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.05.038.
(http://www.sciencedirect.com/science/article/B6T4D-4K22523-1/2/2cd4bcf6e42ab78e3953ba0639208da9)
Abstract:
A combination of stable isotope measurements and gut contents analysis was used to determine the major food sources of the sergestid crustacean Acetes sibogae, in commercial shrimp ponds at two farms in southeast Queensland, Australia. Slight differences were observed between farms but overall the results were consistent. Although gut contents analysis gave a good indication of the range and temporal occurrence of food items consumed by Acetes, it was difficult to ascertain

the contribution each item made to the diet. This was mainly due to the large proportion of unidentifiable material in the guts. All specimens examined contained unidentifiable material and about half the Acetes from both farms contained nothing identifiable. This unidentifiable material may be the result of processing by the Acetes gastric mill or the consumption of detritus, sediment or processed material from shrimp pellets. Only resilient items such as crustacean remains, diatoms and tinntinnids were commonly identified from the guts, and although present over the majority of the sampling period, FOCs were never greater than 25%.
Stable isotope signals were measured for Acetes and likely food sources including pelleted shrimp feed, zooplankton and macroalgae. The pattern of changes in isotopic signals of Acetes across the season showed that zooplankton was a primary food source. Changes in the signals of zooplankton were reflected by changes in Acetes, but the changes in Acetes signal were less pronounced. At both farms, Acetes were more enriched in 13C and 15N (- 15[per mille sign] to - 20[per mille sign] and 12[per mille sign] to 13.8[per mille sign]) than the zooplankton (- 18.9[per mille sign] to - 23.7[per mille sign] and 5[per mille sign] to 13.1[per mille sign]), during the whole season. The absolute difference between the [delta]13C values of Acetes and zooplankton were more consistent than for [delta]15N, but both were greater than might be expected based on fractionation over a single trophic level. Furthermore, laboratory feeding trials showed that fractionation could not explain the greater than expected enrichment of the Acetes signal compared to that measured for zooplankton in the ponds. This, together with evidence from gut content analysis, showed that a food source other than zooplankton must also be important to Acetes. Macroalgae are the most likely additional source, although some minor contribution of pellets or microalgae cannot be ruled out entirely. There was no evidence from either gut contents or stable isotope signatures of dramatic dietary changes for Acetes either through a season or as they grew. It would appear unlikely that Acetes would have a great effect on shrimp production in ponds unless they were extremely abundant early in the season when the postlarvae are also feeding on zooplankton.
Keywords: Stable isotopes; Sergestids; Diet

Sirka Carabel, Enrique Godinez-Dominguez, Patricia Verisimo, Luis Fernandez, Juan Freire, An assessment of sample processing methods for stable isotope analyses of marine food webs, Journal of Experimental Marine Biology and Ecology, Volume 336, Issue 2, 5 September 2006, Pages 254-261, ISSN 0022-0981, DOI: 10.1016/j.jembe.2006.06.001.
(http://www.sciencedirect.com/science/article/B6T8F-4K4PB1N-3/2/57dc05e7aa130b5099f1d82adf977f81)
Abstract:
Carbon and nitrogen stable isotope ratios are commonly used in the study of marine food webs. However, different sample processing methods can influence the measurement of these stable isotope ratios. The purpose of this study is to define an adequate methodology to be used in the construction of whole food webs. It is demonstrated that acidification of the samples results in a decrease in carbon stable isotope values for sedimentary organic matter, suspended particulate organic matter, plankton and invertebrates with carbonated structures. The response was variable for nitrogen isotope ratios. Based on our results we recommend sample acidification for carbon analysis in these compartments where effects of this treatment were observed. We observed a decrease in [delta]13C values after washing with distilled water, so we do not recommend washing with water after acidification. For nitrogen analysis, acidification should be avoided. The various dehydration treatments studied caused significant differences only in nitrogen isotope ratios.
Keywords: Coastal ecosystem; Food web; Sample processing; Stable isotopes

Masako Okamoto, Haruka Dan, Archana K. Singh, Fumiyo Hayakawa, Valer Jurcak, Tateo Suzuki, Kaoru Kohyama, Ippeita Dan, Prefrontal activity during flavor difference test: Application of

functional near-infrared spectroscopy to sensory evaluation studies, Appetite, Volume 47, Issue 2, September 2006, Pages 220-232, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.04.003.
(http://www.sciencedirect.com/science/article/B6WB2-4K7WHWH-1/2/65e04a8d942c70605590b711492c0790)
Abstract:
Sensory evaluation (SE) of food attributes involves various levels of cognitive functions, yet not much has been studied about its neural basis. Using multi-channel functional near-infrared spectroscopy (fNIRS), we examined the activation of the anterior portion of the lateral prefrontal cortex (LPFC) of 12 healthy volunteers during the SE of tea samples. The experimental task used corresponded to the early phase of the same-different test, and required subjects to attentively taste tea samples and memorize their flavors. To isolate activation associated with the cognitive functions involved in the task, we contrasted the results with those achieved by a control (Ctl) task during which subjects held familiar tea samples in their mouths without actively evaluating their flavor. We probabilistically registered the fNIRS data to the Montreal Neurological Institute standard brain space to examine the results as they correspond with other published neuroimaging studies. We found significant activation in the left LPFC and in the right inferior frontal gyrus. The activation pattern was consistent with earlier studies on encoding of other sensory stimuli, with cortical regions supposed to be involved in semantic and perceptual processing. This research makes a start on characterizing the cognitive process employed during SE from the neuroimaging perspective.
Keywords: Optical topography; Diffuse optical imaging; Discrimination test; Difference test; Memory; Delayed matching-to-sample

Cecile Ginane, Bertrand Dumont, Generalization of conditioned food aversions in grazing sheep and its implications for food categorization, Behavioural Processes, Volume 73, Issue 2, September 2006, Pages 178-186, ISSN 0376-6357, DOI: 10.1016/j.beproc.2006.05.006.
(http://www.sciencedirect.com/science/article/B6T2J-4K0C9J1-3/2/189220e9a48c9a4af114415e079251d0)
Abstract:
When grazing on heterogeneous pastures, herbivores may rely on food item generalization and categorization processes for reducing information processing while selecting their diet. The objective of this study was to assess the generalization of an aversion by grazing sheep for items differing by one or two criteria from an item against which they were negatively conditioned. Four items cultivated in pots were offered to the animals, resulting from the combination of an intrinsic criterion, i.e. grass species (ryegrass and fescue) and a transitory criterion, i.e. sward height (tall and short). We assessed the generalization process by comparing binary choices between the initially preferred tall ryegrass and the three other items, before and after animals had been partially conditioned against tall ryegrass.
This method proved useful in assessing the generalization of an aversion. Sheep did not generalize their aversion on the basis of sward height but rather on species: they increased their preference for tall fescue and decreased their instantaneous preference for short ryegrass after having been conditioned against tall ryegrass. The generalization of an aversion through different states of a same species could indicate the possibility of a species-based categorization by grazing herbivores.
Keywords: Aversion; Categorization; Conditioning; Foraging behaviour; Generalization; Sheep

Jamie Isonhood, MaryAnne Drake, Lee-Ann Jaykus, Upstream sample processing facilitates PCR detection of Listeria monocytogenes in mayonnaise-based ready-to-eat (RTE) salads, Food Microbiology, Volume 23, Issue 6, September 2006, Pages 584-590, ISSN 0740-0020, DOI: 10.1016/j.fm.2005.09.004.

(http://www.sciencedirect.com/science/article/B6WFP-4HHH5VJ-3/2/249dff2dba3511d4dcb64a770e84adf0)
Abstract:
Sample pretreatment to reduce volume and concentrate cells of the target organism(s) prior to molecular detection offers a useful supplement or alternative to cultural enrichment. The purpose of this study was to develop an upstream processing method to facilitate the detection of Listeria monocytogenes in ready-to-eat (RTE) salads by PCR. Potato salad, a model RTE commodity, was seeded with L. monocytogenes and processed by two alternative upstream sample processing methods (designated one-step and two-step centrifugation), followed by DNA extraction, PCR amplification, and Southern hybridization. The two-step method resulted in 1000-fold improvements in the PCR detection limit, from 106 Cfu/g (no sample processing) to 103 Cfu/g. The two-step method was applied for upstream sample processing of four representative deli salad items artificially inoculated with L. monocytogenes at levels ranging from 101-106 Cfu/g. Following DNA extraction, PCR amplification, and Southern hybridization, detection was achieved at input levels of 105 Cfu/g for chicken salad, 104 Cfu/g for macaroni salad, and 103 Cfu/g for potato and seafood salads. The two-step method reported here facilitates the production of a final sample concentrate of reduced volume and improved purity which was compatible with PCR amplification. This approach offers further progress in our efforts to reduce or eliminate cultural enrichment in an effort to speed time to results when applying molecular methods to the detection of pathogens in foods.
Keywords: PCR; Bacterial concentration; Pathogen detection; Listeria; Deli salad

M. Zivdar, M. Haghshenas Fard, R.G.H. Prince, Evaluation of Pressure Drop and Mass-Transfer Characteristics of a Structured Packing for Production and Separation of Food Flavours: Part I: Pressure Drop Characteristics, Food and Bioproducts Processing, Volume 84, Issue 3, September 2006, Pages 200-205, ISSN 0960-3085, DOI: 10.1205/fbp.04002.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVNB-5/2/fc2b198c8dfcd8e25aabefbf2bbb0f82)
Abstract:
Structured packings are attractive candidates for food flavour processing by distillation, as their high capacity and low pressure drop allow ready operation under vacuum. Flooding and pressure drop characteristics of a typical packing are presented. Measurements were carried out with air/water in a column of 0.1 m in diameter packed to a height of 1 m with the structured packing. The experimental data were compared with correlations available in the literature, such as the Sherwood-Leva-Eckert (SLE) (McCabe et al, 1993) generalized pressure drop curves, the Kister and Gill (1992) generalized pressure drop curves for structured packing, GPDC(SP), the Wallis (1969), and derived Lockett (1995) correlations. A packing factor of 280 m-1 gave the best fit to the SLE generalized correlation, within +/- 20%, while the GPDC(SP) of Kister and Gill (1992) showed deviations of +/- 30% and +/- 10% for a constant packing factor of 69 m-1, and a variable factor A = B-C x ln X, where X is the flow parameter. The Lockett correlation which uses the specific area of the packings as a scale factor, showed deviations of +/- 10% only. A Wallis form correlation fitted the best results within +/- 2%.
Keywords: structured packing; pressure drop; food flavour; distillation

M.-S. Xu, M.-F. Luo, X.-H. Xing, H.-Z. Chen, Characteristics of Quercetin Transglycosidation Catalysed by Penicillium Decumbens Glycosidase, Food and Bioproducts Processing, Volume 84, Issue 3, September 2006, Pages 237-241, ISSN 0960-3085, DOI: 10.1205/fbp.05143.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVNB-B/2/3981a8cc923fc375b61f8dce6d4ef5ac)
Abstract:

In order to enhance the polarity of quercetin, a popular flavonoid, the effects of temperature, pH, solvents amount and substrate varieties on the transglycosidation by Pencillium decumbens glycosidase were examined. The transglycosidation products (quercitrin) was confirmed and characterized by TLC and MS. The reaction conditions suitable for the transglycosidation were 40-60[degree sign]C, pH 6-7, 30-60% ethanol-water (v/v) by using maltose or glucose as the glycosyl donor. This study suggested that by means of transglycosidation via transglycosidases the polarity of quercetin can be improved, which is beneficial to the processing of the flavonoid and its application in functional foods.
Keywords: quercetin; quercitrin; transglycosidase; flavonoid; polarity

E.D. Caldas, J. Tressou, P.E. Boon, Dietary exposure of Brazilian consumers to dithiocarbamate pesticides--A probabilistic approach, Food and Chemical Toxicology, Volume 44, Issue 9, September 2006, Pages 1562-1571, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.04.014.
(http://www.sciencedirect.com/science/article/B6T6P-4JWDY4G-1/2/fbf63214bd219525c6eb4d2e53a376ab)
Abstract:
A probabilistic estimation of the exposure of the Brazilian population to the dithiocarbamate pesticides was performed using the Monte Carlo Risk Assessment program (MCRA 3.5). Residue data, as CS2, for 3821 samples were obtained from the Brazilian national monitoring program on pesticide residues and from the monitoring program conducted in the Distrito Federal on rice, beans and nine fruits and vegetables. Food consumption data were obtained from a Brazilian household budget survey conducted between 2002 and 2003. Processing factors for washing, peeling or cooking were applied to the residues found in the crops. Daily intakes at the highest percentiles for the general population reached a maximum of 2.0 [mu]g CS2/kg body weight per day (upper band of the 95% confidence interval at P99.99). Tomato, rice, apple and lettuce were the commodities which contributed most to the intake. Based on the registered uses and the toxicological profile of dithiocarbamates, the risk from exposure was evaluated assuming that all residues came from the use of ethylene-bis-dithiocarbamate (EBDC) or that a fraction of it came from the use of propineb. For this last scenario, a cumulative risk assessment was conducted. In the first scenario, the highest intake reached up to 11.9% EBDC ADI for the general population and up to 31.1% ADI for children. When 30% of the residues were considered as coming from propineb use, the values were 15.2% and 39.7% ADI, respectively.
Keywords: Dithiocarbamates; Chronic exposure; Food; Probabilistic exposure assessment

N.R. Reddy, R.C. Tetzloff, H.M. Solomon, J.W. Larkin, Inactivation of Clostridium botulinum nonproteolytic type B spores by high pressure processing at moderate to elevated high temperatures, Innovative Food Science & Emerging Technologies, Volume 7, Issue 3, September 2006, Pages 169-175, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.03.002.
(http://www.sciencedirect.com/science/article/B6W6D-4K0FG19-1/2/b778da2f5be19af6509dd48508d9e25b)
Abstract:
The effect of high pressure and high temperature treatments at various process times on the inactivation of spores of Clostridium botulinum nonproteolytic type B strains, 2-B, 17-B, KAP8-B, and KAP9-B, suspended in phosphate buffer (0.067 M, pH 7.0) and a crabmeat blend was investigated. Spores of KAP8-B were less resistant to high pressure treatment than the spores of 2-B, 17-B, and KAP9-B in both phosphate buffer and crabmeat blend. No survivors of initial counts (> 4.3 log units) of KAP8-B spores were detected in these menstura after processing at 827 MPa and 60 [degree sign]C for 10 min. The amount of inactivation of spores of 2-B, 17-B, and KAP9-B in phosphate buffer or crabmeat blend increased with the increase in processing time from 10 to 30 min at 827 MPa and 75 [degree sign]C. Similar inactivation patterns were observed for these spores in both phosphate buffer and crabmeat blend. A reduction of > 6-log units of 2-B, 17-B, and

KAP9-B spores in phosphate buffer and crabmeat blend was observed at 827 MPa and 75 [degree sign]C for a processing time of between 20 and 30 min. Crabmeat blend as a suspension menstrum provided no protection against inactivation of spores of 2-B, 17-B, and KAP9-B by high pressure processing. High temperature (> 95 [degree sign]C) and lower pressure (620 MPa) treatments for up to 10 min were also found to inactivate 17-B spores in phosphate buffer. Spores of nonproteolytic type B strains, 2-B, 17-B, KAP8-B, and KAP9-B in phosphate buffer and crabmeat blend can be inactivated by a combination of high pressure and temperature treatments.Industrial relevance
Spores of nonproteolytic type B strains of Clostridium botulinum are of primary concern because they have been involved in the foodborne botulism outbreaks associated with marine products. Foodborne botulism results from consumption of these foods in which C. botulinum has grown and produced neurotoxin. Recently, high pressure processing (HPP) received a great deal of interest because of its ability to destroy vegetative pathogens, viruses, and certain bacterial spores and results in a product with natural sensory, quality, and nutritional attributes. Currently, HPP is being evaluated at the National Center for Food Safety and Technology as an alternative to other traditional thermal processes for its ability to inactivate C. botulinum spores. In this study, the effects of high pressure in conjunction with moderate to elevated high temperatures on inactivation of C. botulinum nonproteolytic type B spores were investigated. Based on limited number of strains tested, HPP showed a potential of destroying spores of nonproteolytic type B strains of C. botulinum when process temperature is above 75 [degree sign]C.
Keywords: High pressure processing; Inactivation; Clostridium botulinum; Spores

Song Miao, Yrjo H. Roos, Isothermal study of nonenzymatic browning kinetics in spray-dried and freeze-dried systems at different relative vapor pressure environments, Innovative Food Science & Emerging Technologies, Volume 7, Issue 3, September 2006, Pages 182-194, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.11.001.
(http://www.sciencedirect.com/science/article/B6W6D-4JDN6FB-7/2/d14d093d21f529a280fae65d5e93ccf0)
Abstract:
Nonenzymatic browning (NEB) in freeze-dried and spray-dried lactose, trehalose, and lactose/trehalose-based food model systems containing L-lysine and D-xylose (2% w/w) as reactants was investigated at four different relative vapor pressure (RVP) (33.2%, 44.1%, 54.5%, 65.6%) environments at room temperature. Sorption isotherms of model systems were determined gravimetrically and data were modelled using the Brunauer-Emmett-Teller (BET) and Guggenheim-Anderson-deBoer (GAB) models. Glass transition, Tg, was measured by DSC. Physical structure of model systems was observed by SEM. NEB was followed spectrophotometrically. Freeze-dried and spray-dried systems had different physical structures and sorption properties, but similar glass transition behavior. NEB kinetics seemed to be affected not only by the matrix composition but also by the physical properties of the materials obtained by different drying methods. Crystallization of the component sugars seemed to have direct relation to the NEB reaction. The results indicated that different physical properties of the materials by different drying methods should be considered in controlling the NEB reaction in real low-moisture food systems.Industrial relevance
Nonenzymatic browning, as a model of a possibly diffusion, controlled binary reaction between amino acids and reducing sugars produces flavours and colors but may also cause detrimental changes during processing and storage of foods. The objective of this study was to determine non enzymatic browning kinetics and the effects of different drying methods on the nonenzymatic browning behaviour of food models. According to the study presented application of the results to real food systems should take into account differences in physical properties of dried, low-moisture, food systems.
Keywords: Spray-drying; Freeze-drying; Nonenzymatic browning; Lactose; Trehalose

Lei Xu, Ashwani Kumar, Karen Lamb, Linda Layton, Recovery of isoflavones from red clover flowers by a membrane-based process, Innovative Food Science & Emerging Technologies, Volume 7, Issue 3, September 2006, Pages 251-256, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.12.001.
(http://www.sciencedirect.com/science/article/B6W6D-4J9N0WH-1/2/5f159df95a1ab3254dcb200857b9a5dc)
Abstract:
Isoflavones in red clover flowers were extracted and recovered using a new process that mainly comprised of ethanol extraction, membrane processing, micelle formation and drying. To obtain maximum isoflavone extraction an ethanol concentration between 40% and 50% in water was found to be optimal. The extracted isoflavones were processed by ultrafiltration for preliminary purification, and then concentrated by reverse osmosis. As ethanol was removed by evaporation, micelles were formed in the reverse osmosis retentate, which was dried to yield an isoflavone-enriched product. This product contained about 9% isoflavone highlighting its potential use as a direct nutraceutical supplement.Industrial relevance
Isoflavones present in agricultural biomass are utilized as source of functional food supplements. Extraction and refining of isoflavones involves several steps and the process is very energy intensive. This work reports an interesting approach for extraction and refining of isoflavones by developing a new process, which is energy efficient and gives a final product, which contains sufficiently high amounts of isoflavones for consumer applications.
Keywords: Isoflavones; Red clover flower; Extraction; Membrane and process

Lebert Isabelle, Lebert Andre, Quantitative prediction of microbial behaviour during food processing using an integrated modelling approach: a review, International Journal of Refrigeration, Volume 29, Issue 6, Issue with Special Emphasis on Data and Models on Food Refrigeration, September 2006, Pages 968-984, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2006.04.008.
(http://www.sciencedirect.com/science/article/B6V4R-4KBX4M7-1/2/52c14048417e70eb25044762421085a0)
Abstract:
Microbiological safety of food relies on microbial examination of raw materials and final products, coupled with monitoring process parameters and hygiene standards. The concept of predictive microbiology was developed to evaluate the effect of processing, distribution and storage operations on food safety. The objective of this paper is to review the approaches proposed by researchers to quantify the effect of competitiveness or fluctuating conditions on bacterial behaviour. The main microbial models that quantify the effects of various hurdles on microbial kinetics are presented. To provide complementary information for microbial models, three areas have to be considered: process engineering that characterises and models mass and heat transfer; microbiology that characterises and models bacterial behaviour and metabolite production, and; applied thermodynamics that characterises and models the physico-chemical properties of a food product. Global modelling approaches, developed by integrating the previous models, are illustrated with recent results.
Keywords: Food; Manufacturing; Chilling; Modelling; Growth; Survival; Bacteria; Microbiology; Produit alimentaire; Fabrication; Refrigeration; Modelisation; Croissance; Survie; Bacterie; Microbiologie

M. Pugalenthi, P. Siddhuraju, V. Vadivel, Effect of soaking followed by cooking and the addition of [alpha]-galactosidase on oligosaccharides levels in different Canavalia accessions, Journal of Food Composition and Analysis, Volume 19, Issues 6-7, Biodiversity and nutrition: a common

path, September-November 2006, Pages 512-517, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.05.002.
(http://www.sciencedirect.com/science/article/B6WJH-4J72YVJ-2/2/a5fada5a6487b2cb103841caf5fca3b9)
Abstract:
The seed materials of different accessions of Canavalia ensiformis and Canavalia gladiata were collected from the Eastern and Western Ghats, South India and they were subjected to analysis for their oligosaccharide content. Further, the effect of soaking followed by cooking, a traditional processing method, and partially purified [alpha]-galactosidase, extracted from a common guar weed (Cassia sericea), on the levels of flatulence factors (raffinose, stachyose and verbascose) in different accessions was investigated. The contents of raffinose, stachyose and verbascose and total oligosaccharides in all the investigated accessions of raw seed samples ranged between 0.68 and 1.47; 0.61 and 2.61; 3.47 and 6.64 and 4.92 and 9.84 g 100 g-1 seed flour, respectively, and verbascose being the predominant oligosachharide. Application of partially purified [alpha]-galactosidase significantly reduced the content of oligosaccharides (71-85%) rather than soaking followed by cooking (14-47%). Such enzymatic treatment could enhance the utilization of Canavalia beans as a potential food source without flatulence obstacles compared to conventional treatments.
Keywords: Accessions; Jack bean; Sword bean; Oligosacharides; [alpha]-galactosidase treatment

Milan Suhaj, Spice antioxidants isolation and their antiradical activity: a review, Journal of Food Composition and Analysis, Volume 19, Issues 6-7, Biodiversity and nutrition: a common path, September-November 2006, Pages 531-537, ISSN 0889-1575, DOI: 10.1016/j.jfca.2004.11.005.
(http://www.sciencedirect.com/science/article/B6WJH-4H99JDG-1/2/fe88f7aca36c2e184ef9b19bdaad911e)
Abstract:
Antioxidant compounds in food play important roles as health-protecting factors. Antioxidants are also widely used as additives in fats and oils and in food processing to prevent or delay spoilage of foods. Spices and some herbs have received increased attention as sources of many effective antioxidants. This review presents some information about the most common and most-used spice antioxidants, methods of their preparation and describes their antioxidant/antiradical properties.
Keywords: Spices; Herbs; Antioxidants; Isolation; Antioxidant activity

S.J. James, J.A. Evans, Predicting the reduction in microbes on the surface of foods during surface pasteurisation--the `BUGDEATH' project, Journal of Food Engineering, Volume 76, Issue 1, Bugdeath, September 2006, Pages 1-6, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.05.011.
(http://www.sciencedirect.com/science/article/B6T8J-4GX1HVM-1/2/4dbd3fecaf0e453833647c2c54fdf3d4)
Abstract:
The prime objective of the BUGDEATH project was to produce accurate predictive models of the reductions in microbial numbers that can be achieved on the surface of foods during surface pasteurisation processes. These models will enable a wide range of food manufacturers to design more effective and efficient surface pasteurisation treatments than can be produced with current microbial death models and data.
During the project test apparatus was built and delivered to partners that can create `rapid' heating processes, where surface temperatures rise from 5 to 100 [degree sign]C in less than 1 min, can be held at a set temperature and then cooled rapidly. Slower heating and cooling processes can be carried out to compare the effects of heating and cooling times on bacterial death. Both dry and wet (steam) heating were possible.
The partners carrying out microbiological trials used the test apparatus. Bacterial death was monitored by viable counts and also by specialist techniques including use of a low light-level

camera and bacteria tagged with lux genes. Using organisms which have been treated by adding lux genes to make them glow (bioluminescence), and applying them to the food surface to be treated, the scientists can quickly measure changes taking place in the bacteria. If the bioluminescence fades when the food is treated then the process is effective. The bacteria glow brightly when healthy, fade when expiring and stop glowing the moment they stop metabolizing.
The major aim of the project was to create a user-friendly heat transfer and microbial death model. These models were validated against published data and data provided by the partners. The programme simulates inactivation kinetics of microorganisms on food surfaces, during dry and wet pasteurisation treatments under constant and time-varying temperature conditions. On the basis of selection of a heating regime of the medium, the programme allows accurate prediction of food surface temperature and simulates the microbial load content along the whole process time. Input data and simulated values can be visualised in graphics or data tables. Printing, exporting and saving file options are available. It includes a useful database of foods (i.e. beef and potato) and related thermal properties, microorganisms (i.e. Listeria monocytogenes and Salmonella) and corresponding inactivation kinetic parameters.
The software can be used to simulate results during pasteurisation treatments. The pull off simulations can be valuable to a wide variety of companies in the food industry for developing appropriate and safe processes. The software has also the potential of being exploited for educational purposes.
The project involved 8 partners from 5 countries and was coordinated by FRPERC from the University of Bristol, UK. As part of the project the research team recruited an Industrial Advisory Group (IAG) to ensure that the project was relevant and useful to the European food industry.
Keywords: Decontamination; Heat processing; Pasteurisation

Maria M. Gil, Teresa R.S. Brandao, Cristina L.M. Silva, A modified Gompertz model to predict microbial inactivation under time-varying temperature conditions, Journal of Food Engineering, Volume 76, Issue 1, Bugdeath, September 2006, Pages 89-94, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.05.017.
(http://www.sciencedirect.com/science/article/B6T8J-4GHSG9P-5/2/fd647b9cdb10a44b1391b8900119caf3)
Abstract:
Development of effective heat treatments is crucial to achieve food products' safety, and predictive microbiology is an excellent tool to design adequate processing conditions.
This work focuses on the application of a modified Gompertz model to describe the inactivation behaviour under time-varying temperature conditions at the surface of a food product. Kinetic studies were carried out assuming two different heating regimes, typically used in surface pasteurisation treatments, and compared with isothermal conditions. Parameters were estimated on the basis of generated pseudo-experimental data. It was concluded that the heating period greatly affects microbial inactivation and parameter estimation. If a slow heating treatment is used, the process time should be extended to achieve a given microbial load when compared to a fast heating process. This is explained by the fact that, in the slow heating rate process the temperature was below the lowest temperature for inactivation for a much longer time, in comparison with the fast heating regime.
Keywords: Predictive microbiology; Gompertz model; Inactivation kinetics; Time-varying temperature

Krittalak Chakrabandhu, Rakesh K. Singh, Determination of food particle residence time distributions in coiled tube and straight tube with bends at high temperature using correlation analysis, Journal of Food Engineering, Volume 76, Issue 2, September 2006, Pages 238-249, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.04.047.

(http://www.sciencedirect.com/science/article/B6T8J-4GK1G90-3/2/8d66d03906b7d7ccec27cd90e176bdc8)
Abstract:
The effects of tube geometry (coiled and straight), particle concentration (0-30% v/v), average product flow rate, and carrier fluid temperature (96-124 [degree sign]C) on residence time distributions of model food particles in the holding section of an aseptic processing system were investigated by means of correlation analysis. Hold tube geometry and flow rate exerted significant effects on the mean normalized residence time. Minimum normalized residence time was significantly influenced by the fluid temperature and the interaction between hold tube geometry and particle concentration. In the coiled tube, standard deviation of normalized residence time decreased with an increase in particle concentration. The fastest-moving particles in the coiled tube possessed a velocity of 1.96 times the average product velocity, whereas the velocity of fastest-moving particle in the straight tube was 1.8 times the average product velocity. Based on empirical expressions of the residence time parameters as functions of particle concentration and dimensionless groups (Frf, Regp, and Arf), variable influence of several forces on particle residence time of particulate food suspensions in different settings was deduced.
Keywords: Residence time distribution; Particulate foods; Coarse suspension; Curved tube; Aseptic processing

Geraldine Duffy, Enda Cummins, Padraig Nally, Stephen O' Brien, Francis Butler, A review of quantitative microbial risk assessment in the management of Escherichia coli O157:H7 on beef, Meat Science, Volume 74, Issue 1, 52nd International Congress of Meat Science and Technology (52nd ICoMST) 13-18 August 2006 Dublin, Ireland, September 2006, Pages 76-88, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2006.04.011.
(http://www.sciencedirect.com/science/article/B6T9G-4JW7FJN-3/2/4c8c9fd6a227e5eb0ed3b43820d5c98a)
Abstract:
Since Escherichia coli O157:H7 first emerged as a food borne pathogen in the mid 1980s, it has been linked to many cases of food poisoning across the world. While multiple sources and routes of transmission for this pathogen are now recognised, beef and beef products remain an important vehicle of the pathogen and continue to be linked to outbreaks across the developed world. Much research has been directed at E. coli O157:H7 transmission, survival and control in the beef chain and this paper presents an overview of current knowledge on this pathogen in the beef chain from primary production through slaughter, processing, distribution, final preparation and cooking. In order to strategically manage E. coli O157:H7 and to devise approaches to reduce the public health risk posed, many national and international groups have applied quantitative risk assessment techniques to model the risk posed by E. coli O157:H7 in beef, particularly in ground/minced beef which is most often linked with infection. This paper reviews these quantitative risk assessments and their application in managing the risk posed by E. coli O157:H7 in beef.
Keywords: E. coli O157:H7; Quantitative risk assessment; Beef

Fidel Toldra, Milagro Reig, Methods for rapid detection of chemical and veterinary drug residues in animal foods, Trends in Food Science & Technology, Volume 17, Issue 9, INTRADFOODS - Innovations in Traditional Foods - EFFoST 2005 conference, September 2006, Pages 482-489, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.02.002.
(http://www.sciencedirect.com/science/article/B6VHY-4JKYTJ9-1/2/5c6f13fc096257e3f7fc7fc1d341ae07)
Abstract:
Rapid methods and automation for the detection and characterisation of chemical and veterinary drug residues in foods of animal origin constitutes a dynamic area in food processing and is experiencing important developments mainly from the standpoint of food safety. Residues from

these substances may be present in edible tissues, milk and eggs for human consumption and may exert different levels of toxicity on consumers when consuming them. Thus, easy, rapid and sensitive tests are really needed for an effective at-line use. This manuscript is presenting latest developments for rapid detection of chemical and veterinary drugs residues in foods of animal origin.

Ana Allende, Francisco A. Tomas-Barberan, Maria I. Gil, Minimal processing for healthy traditional foods, Trends in Food Science & Technology, Volume 17, Issue 9, INTRADFOODS - Innovations in Traditional Foods - EFFoST 2005 conference, September 2006, Pages 513-519, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.04.005.
(http://www.sciencedirect.com/science/article/B6VHY-4K5HWD3-1/2/f689fb33da6bc26e7e88a4ebd3ed5ca4)
Abstract:
The industry of fresh-cut fruits and vegetables is constantly growing due to consumers demand. New techniques for maintaining quality and inhibiting undesired microbial growth are demanded in all the steps of the production and distribution chain. In this review, we summarize some of the new processing and preservation techniques that are available in the fresh-cut industry. The combination of sanitizers with other intervention methods is discussed. The use of ultraviolet-C, modified-atmospheres, heat shocks and ozone treatments, alone or in different combinations have proved useful in controlling microbial growth and maintaining quality during storage of fresh-cut produce. In addition, combinations of physical and chemical treatments are also reviewed. The use of acidic or alkaline electrolyzed water (AcEW), chlorine dioxide, power ultrasound and bacteriocins and the potential applications to the fresh-cut products industry to control human microbial pathogens are presented.
Keywords: Fruits and vegetables; Modified atmospheres; Sanitizers; Quality; Safety

M. Janssen, A.H. Geeraerd, F. Logist, Y. De Visscher, K.M. Vereecken, J. Debevere, F. Devlieghere, J.F. Van Impe, Modelling Yersinia enterocolitica inactivation in coculture experiments with Lactobacillus sakei as based on pH and lactic acid profiles, International Journal of Food Microbiology, Volume 111, Issue 1, 15 August 2006, Pages 59-72, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.06.001.
(http://www.sciencedirect.com/science/article/B6T7K-4KHC2XS-2/2/030f7d468993fa7771ef99f33ef728a0)
Abstract:
In food processing and preservation technology, models describing microbial proliferation in food products are a helpful tool to predict the microbial food safety and shelf life. In general, the available models consider microorganisms in pure culture. Thus, microbial interactions are ignored, which may lead to a discrepancy between model predictions and the actual microbial evolution, particularly for fermented and minimally processed food products in which a background flora is often present. In this study, the lactic acid mediated negative microbial interaction between the lactic acid bacterium Lactobacillus sakei and the psychrotrophic food pathogen Yersinia enterocolitica was examined. A model describing the lactic acid induced inhibition (i.e., early induction of the stationary phase) of the pathogen [Vereecken, K.M., Devlieghere, F., Bockstaele, A., Debevere, J., Van Impe, J.F., 2003. A model for lactic acid induced inhibition of Yersinia enterocolitica in mono- and coculture with Lactobacillus sakei. Food Microbiology 20, 701-713.] was extended to describe the subsequent inactivation (i.e., decrease of the cell concentration to values below the detection limit). In the development of a suitable model structure to describe the inactivation process, critical points in the variation of the specific evolution rate [mu] [1/h] with the dynamic (time-varying) pH and undissociated lactic acid profiles were taken into account. Thus, biological knowledge, namely, both pH and undissociated lactic acid have an influence on the microbial evolution, was incorporated. The extended model was carefully validated on new data.

As a result, the newly developed model is able to accurately predict the growth, inhibition and subsequent inactivation of Y. enterocolitica in coculture as based on the dynamic pH and lactic acid profiles of the medium.
Keywords: Predictive microbiology; Microbial interactions; Growth inhibition; Microbial inactivation; Lactic acid; Yersinia enterocolitica; Lactobacillus sakei; Model validation

P.O. Okelo, D.D. Wagner, L.E. Carr, F.W. Wheaton, L.W. Douglass, S.W. Joseph, Optimization of extrusion conditions for elimination of mesophilic bacteria during thermal processing of animal feed mash, Animal Feed Science and Technology, Volume 129, Issues 1-2, 4 August 2006, Pages 116-137, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2005.12.011.
(http://www.sciencedirect.com/science/article/B6T42-4J624FX-1/2/b8583dc0ca64cdd18963410e98be6eda)
Abstract:
Salmonella and other pathogenic organisms that infect poultry and other livestock can originate from feed and environmental sources. Thus, measures are taken to control Salmonella infection in animals to improve food safety and reduce production losses. The current study was designed to investigate and optimize extrusion conditions for reducing bacterial counts in a surrogate feed matrix. A single-screw extruder was used to process feed artificially inoculated with Bacillus stearothermophilus 12980 (ATCC, Reston, Virginia). Preliminary experiments demonstrated that Salmonella typhimurium (S. typhimurium NALr) was eliminated from feed under conditions of moderate extrusion stringency (285 g moisture/kg mash feed, 83 [degree sign]C extruder barrel exit temperature, 7 s retention time in the extruder barrel) and, therefore, a more thermotolerant organism was required to conduct the study. Spores of B. stearothermophilus 12980 inoculated into a surrogate feed matrix consisting of 600 g maize meal/kg, 300 g soya bean meal/kg and 100 g animal protein blend/kg, respectively, was used to investigate the effect of three extrusion variables on microbial killing. The three variables were extruder barrel exit temperature (T), mash feed moisture content (Mc), and mean retention time of feed in the extruder barrel (Rt). A rotatable central composite statistical design was used with three independent variables and five levels each. The quadratic response surface model fit to spore count data was used to predict extrusion conditions that maximized bacterial killing. The response surface indicated a stationary point within the design region that was a saddle. An estimated ridge of maximum killing indicated that a maximum reduction of 1.03 log cycles would occur under the following extruder settings: T = 110 [degree sign]C, Mc = 245 g/kg and Rt = 11 s. Because the moderate stringency condition (T = 83 [degree sign]C, Mc = 285 g/kg and Rt = 7 s) completely eliminated detectable S. typhimurium in the test feed matrix, it would appear that all S. typhimurium cells and all mesophilic organisms of similar thermal tolerance would be eliminated at most extruder conditions within the central composite design region.
Keywords: Salmonella typhimurium; Bacillus stearothermophilus; Bacteria; Feeds; Extrusion; Mash; Thermal processing

Min-Sheng Su, Juan L. Silva, Antioxidant activity, anthocyanins, and phenolics of rabbiteye blueberry (Vaccinium ashei) by-products as affected by fermentation, Food Chemistry, Volume 97, Issue 3, August 2006, Pages 447-451, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.05.023.
(http://www.sciencedirect.com/science/article/B6T6R-4GNCJ35-3/2/ba1de3b5d136a14b186b9ce21f17c25b)
Abstract:
Basic blueberry processing includes juice processing or winemaking. By-products obtained from the juice and wine industry can be a source of new value-added products such as phenolic antioxidant supplements or ingredients for food processing. The phenolic compositions of products and by-products (pomaces) depend mainly on processing techniques such as duration of skin contact, crushing, pressing, and others. The present study was to evaluate the effects of

fermentation type on retention of total anthocyanins, total phenolics, and antioxidant activity of blueberry by-products. Total phenolics (TPH), total anthocyanins (ACY), antioxidant activities ([beta]-carotene bleaching assay and ferric thiocyanate assay), and antiradical activity (DPPH radical-scavenging assay) of rabbiteye blueberry (Vaccinium ashei) by-products (juice, wine, and vinegar pomaces) were determined. The wine pomace (WP) had higher TPH, antioxidant activities and antiradical activity. Vinegar pomace (VP) had the lowest ACY, TPH, antiradical activity, and antioxidant activities. The results indicate that the antioxidant and antiradical activities of blueberry by-products were not significantly affected by the wine making process. Acetification significantly decreased TPH, ACY, antioxidant activities, and antiradical activity. However, VP still maintained an important phenolics concentration and antioxidant activity.
Keywords: Blueberries; Antioxidant activity; Fermentation; Acetification; Pomaces

R. Simpson, I. Figueroa, A. Teixeira, Optimum on-line correction of process deviations in batch retorts through simulation, Food Control, Volume 17, Issue 8, August 2006, Pages 665-675, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.06.004.
(http://www.sciencedirect.com/science/article/B6T6S-4GXVG4C-1/2/9e8496656032d9bfc1d078a73a43ec84)
Abstract:
This paper describes broader applications of computer-based batch retort control systems that make use of mathematical models to accomplishing on-line correction of unexpected process deviations in thermal processing of low-acid canned foods. Current systems over extend process time with costly consequences to product quality and retort operating schedules in cook room operations. These problems are addressed by describing novel control strategies that also treat the retort temperature as a control variable, rather than just process time alone. On-line correction is accomplished by choosing an optimum higher constant retort temperature for the remainder of the process that will deliver the specified target lethality within the original process time remaining. The paper also describes on-line correction of process deviations occurring during a pre-programmed variable or dynamic retort temperature process that might be chosen to maximize nutrient retention in a conduction-heated food. In this situation, an optimum combination of retort temperature and process time is chosen for the remainder of the process that will deliver the maximum possible nutrient retention without compromising the specified final target lethality. Examples are given for the case of solid product undergoing a conduction-heating process in different shaped containers (cylindrical can and retort pouch), as well as liquid product undergoing forced convection heating in cylindrical cans under mechanical agitation.
Keywords: On-line control; Process optimization; Thermal process; Retort; Autoclave; Low-acid foods; Canned foods; Batch processing; Conduction heated; Forced convection; Process deviations; On-line correction

Jeonghee Surh, Loren S. Ward, D. Julian McClements, Ability of conventional and nutritionally-modified whey protein concentrates to stabilize oil-in-water emulsions, Food Research International, Volume 39, Issue 7, August 2006, Pages 761-771, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.01.007.
(http://www.sciencedirect.com/science/article/B6T6V-4JKHM2G-1/2/07af9d66948e5997ac6b675f4cf008eb)
Abstract:
The ability of a modified whey protein concentrate (MWPC), which contains relatively high proportions of phospholipid and high molecular weight protein fractions, to form and stabilize 10 wt% corn oil-in-water emulsions (pH 7.0, 5 mM phosphate buffer) was compared with that of a conventional whey protein concentrate (CWPC). The MWPC stabilized emulsions required less protein to prepare stable emulsions with monomodal particle size distributions and small mean droplet diameters (d43 [approximate] 0.3 [mu]m at [WPC] [greater-or-equal, slanted] 0.5 wt%) than

CWPC stabilized emulsions (d43 [approximate] 0.4 [mu]m at [WPC] [greater-or-equal, slanted] 0.9 wt%) under similar homogenization conditions (5 passes at 5000 psi). In addition, the emulsions stabilized by 0.9 wt% MWPC were more stable to high salt concentration (NaCl [less-than-or-equals, slant] 200 mM), thermal processing (30-90 [degree sign]C for 30 min) and pH (3, 6 and 7) than those stabilized by the same concentration of CWPC, which was attributed to polymeric steric repulsion rather than electrostatic repulsion. This study has important implications for the wide application of WPC as a natural emulsifier in food products.
Keywords: Oil-in-water emulsion; Whey protein concentrate; Molecular weight; Phospholipid

P. Laohavechvanich, K. Kangsadalampai, N. Tirawanchai, A.J. Ketterman, Effect of different Thai traditional processing of various hot chili peppers on urethane-induced somatic mutation and recombination in Drosophila melanogaster: Assessment of the role of glutathione transferase activity, Food and Chemical Toxicology, Volume 44, Issue 8, August 2006, Pages 1348-1354, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.02.013.
(http://www.sciencedirect.com/science/article/B6T6P-4JF3T8D-1/2/f8dce29658aff42b12ff808f8f17dc63)
Abstract:
Four different Thai traditional chili peppers, namely bird pepper (Capsicum frutescens), red chili spur peppers (Capsicum annuum), green bell peppers and sweet pepper (C. annuum) were investigated for their antimutagenic properties. Each chili was prepared in three formulations commonly used for chili food processing; raw paste (chili ground in water), pickled in vinegar or stir-fried in palm oil. Each sample was tested for its antimutagenic effect against urethane by using the somatic mutation and recombination of wing hair of Drosophila melanogaster as an indicator. Three-day-old larvae, trans-heterozygous for two genetic markers, multiple wing hairs mwh and orrigon (ORR; flr3), were exposed to urethane alone or in combination with each chili formulation. The various processing methods for chilies differentially extracted the antimutagenic chili components. The specific chili as well as the method of processing influenced the observed antimutagenic properties against urethane. This suggested each chili contains a unique complex mixture of many antimutagens. Co-treatment and pre-treatment experiments showed that both direct and indirect protective mechanisms are involved in an `activation' process to give antimutagenesis effects. An association between antigenotoxicity and glutathione transferase activity could not be established.
Keywords: Chili; Urethane; SMART; Glutathione transferase; Antimutagens

Gregoire Tauveron, Christian Slomianny, Celine Henry, Christine Faille, Variability among Bacillus cereus strains in spore surface properties and influence on their ability to contaminate food surface equipment, International Journal of Food Microbiology, Volume 110, Issue 3, 1 August 2006, Pages 254-262, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.04.027.
(http://www.sciencedirect.com/science/article/B6T7K-4K7F9DW-3/2/848581f90c2460d7f15df0cacefe2698)
Abstract:
Seven strains of Bacillus cereus isolated from the environment and from patients with diarrheic symptoms were examined from two angles: their spore surface properties, and their ability to adhere to stainless steel and to resist a cleaning in place (CIP) procedure. Our results revealed significant differences in their morphology (size of exosporium, length and number of appendages), hydrophobic character and surface protein composition. Most of these proteins originated in the vegetative cell and were tightly bound to the external surface of the exosporium such as EA1 or alanine racemase. Spore adhesion properties also varied from strain to strain. The ability to adhere was higher when spores were surrounded by long appendages, while the largest spores displayed the least resistance to cleaning. These observations suggest that food processing line contamination might be due to a given type of strain with specific surface

properties (long appendages and small exosporium), which would represent an increased threat under the milder processing conditions required by consumers (minimally heat-treated foods for example) and by legal requirements (to limit effluents caused by hygiene procedures). Elsewhere, no clear relationship of the strain characteristics to the clinical vs. foodborne strains could be established.
Keywords: Bacillus cereus; Spore; Exosporium; Appendages; Adhesion; CIP

Heimo Scherz, Eva Kirchhoff, Trace elements in foods: Zinc contents of raw foods--A comparison of data originating from different geographical regions of the world, Journal of Food Composition and Analysis, Volume 19, Issue 5, August 2006, Pages 420-433, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.10.004.
(http://www.sciencedirect.com/science/article/B6WJH-4JVSVFB-1/2/41c16d1e2b96acfc5ed8c169e075be0f)
Abstract:
Zinc is one of the most important essential trace elements in human nutrition. A zinc deficiency of the human body leads to several disorders, but an excessive zinc intake also causes various acute and chronic adverse effects. Therefore an adequate supply of zinc from food is a basic necessity, and the documentation of reliable quantitative data in several international food composition tables is of general interest. In this study, the zinc contents of selected raw foods, originating from different continents of the world, are compiled, and their variations are displayed. Representative foods for several food groups like milk, meat, fish, cereals, vegetables and fruits are discussed comparatively. Interestingly, we could posit a remarkable consistency in the amounts of zinc in raw foods, especially in edible animal offal and some vegetable raw materials, deriving from European, Asian, African or American regions. The contamination of soils, such as that caused by metal processing industries, is significantly influencing the zinc concentration in plants. The standard of knowledge concerning the forms and mechanisms of the molecular binding of zinc in animal and plant tissues is summarized.
Keywords: Raw foods; Zinc content; Zinc-binding compounds; Geographical influence; International food composition tables

Beverly J. McCabe-Sellers, Cathleen G. Staggs, Margaret L. Bogle, Tyramine in foods and monoamine oxidase inhibitor drugs: A crossroad where medicine, nutrition, pharmacy, and food industry converge, Journal of Food Composition and Analysis, Volume 19, Supplement 1, 28th US National Nutrient Databank Conference, August 2006, Pages S58-S65, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.12.008.
(http://www.sciencedirect.com/science/article/B6WJH-4JS1MV4-1/2/08daed31151af4e8ab0f8cbca84588bf)
Abstract:
Since identification of the 'cheese reaction' hypertensive crisis induced by dietary tyramine with monoamine oxidase inhibitors (MAOIs) drugs, numerous articles have addressed the biogenic amine (BA) content of foods. The objective of this review is to explain why many published analyses are no longer valid. Clinically significant BA levels from literature published between 1945 and 2003 were reviewed and compiled and are presented in common units. Clinical recommendations based on newer reports about foods and drugs are offered. Reliance on case reports without chemical analyses led to unnecessary dietary restrictions. Extrapolation of analysis from one food to a similar food led to lengthy lists of banned foods. Early analyses are no longer valid for several reasons: better methods to accurately identify these amines, better packaging methods, recognition of critical processing points in prevention of BA formation, better storage and handling procedures, and substitution of cultures less likely to form amines have reduced the risks of these Food-drug interactions. New generations of MAOIs and different administration routes allow smaller effective dosage and lower risks for interactions. This review of BAs illustrates

variability of food components over time, progress of food industry toward a safer food supply, development of better drugs, and the necessity for medicine, nutrition, pharmacy, and food industry to work together.
Keywords: Biogenic amines; Tyramine; MAOI drugs; Food-drug interactions

Jaswinder Anand, Nancy R. Raper, Amy Tong, Quality assurance during data processing of food and nutrient intakes, Journal of Food Composition and Analysis, Volume 19, Supplement 1, 28th US National Nutrient Databank Conference, August 2006, Pages S86-S90, ISSN 0889-1575, DOI: 10.1016/j.jfca.2006.02.005.
(http://www.sciencedirect.com/science/article/B6WJH-4JRVDVS-B/2/af9b3da67f317e46d29ea51bc1df91a7)
Abstract:
The Food Surveys Research Group (FSRG) is responsible for methods of data collection and processing of dietary intake data, including the What We Eat in America Survey, which is the dietary interview component of the National Health and Nutrition Examination Survey (NHANES). Many measures have been implemented to ensure accuracy of the dietary data, such as a state-of-the-art data collection instrument and an extensive food and nutrient database. Also important, but usually receiving less public attention is the quality assurance taking place during data processing. A four-part quality assurance procedure is used for food intake data processed by FSRG. This includes (1) determination of overall acceptability of each 24-h recall, (2) resolution of new or unusual foods and amounts, (3) administration of data integrity checks, and (4) verification of 24-h recalls with extremely high nutrient intakes. Quality assurance not only contributes to the accuracy and validity of a specific set of dietary intake data, it also benefits future studies because findings help identify areas to target for interviewer training or for improvements in data collection and processing procedures.
Keywords: Food and nutrient intakes; Quality control

Serdar Oztekin, Bulent Zorlugenc, Feyza Kirog[caron]lu Zorlugenc, Effects of ozone treatment on microflora of dried figs, Journal of Food Engineering, Volume 75, Issue 3, August 2006, Pages 396-399, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.04.024.
(http://www.sciencedirect.com/science/article/B6T8J-4GDSDNH-1/2/4b775c5e66aac4720166e10afde79f7b)
Abstract:
Ozone application to control odour, bacteria, germ, virus and mould is widely used in many fields of food processing. To inactivate microbial flora on dried figs ozone was applied in gas form for three and five hours at 5 and 10 ppm. A statistically significant reduction in the total bacterial, coliform and yeast/mould counts were obtained ($P < 0.05$). Escherichia coli was not found on the samples. Results indicate that to reduce microorganism count on dried figs minimum three hours treatment at 5 ppm is required. Decrease in total aerobic mesophyllic microorganism and yeast/mould counts was approx. 38% and 72% at this level where all coliform bacteria were inactivated.
Keywords: Dried figs; Ozone treatment; Microbial flora

S.A.L.M. Kooijman, Pseudo-faeces production in bivalves, Journal of Sea Research, Volume 56, Issue 2, Dynamic Energy Budgets in Bivalves, August 2006, Pages 103-106, ISSN 1385-1101, DOI: 10.1016/j.seares.2006.03.003.
(http://www.sciencedirect.com/science/article/B6VHH-4JKR6DC-1/2/4a9d49a68549465f6bd5b941ebbe4ec0)
Abstract:
Many filter feeders produce pseudo-faeces from selected particles that are filtered; pseudo-faeces does not pass the gut. Food intake can be limited by the filtering (acquisition) as well as the

digestion (processing) rate. Its dynamics can be analysed in a straightforward way in the context of the Dynamic Energy Budget (DEB) theory using the closed hand-shaking protocol of Synthesizing Units. The model reveals how food intake depends on the relative size of the filtering and digestion machinery, which can be used to model differentated growth of these structures if allocation is linked to their relative workload. It turns out that non-digestible particles modify the apparent half-saturation coefficient, which makes that estimates for this coefficient can be used to quantify the mean silt load in a given habitat.
Keywords: Synthesizing Units; DEB theory; Pseudo-faeces; Half-saturation coefficient; Differentiated growth; Filtering rate; Digestion rate; Food intake

Y.N. Njintang, C.M.F. Mbofung, Effect of precooking time and drying temperature on the physico-chemical characteristics and in-vitro carbohydrate digestibility of taro flour, LWT - Food Science and Technology, Volume 39, Issue 6, August 2006, Pages 684-691, ISSN 0023-6438, DOI: 10.1016/j.lwt.2005.03.022.
(http://www.sciencedirect.com/science/article/B6WMV-4GH4B4F-1/2/f548fa5b10b4b26d4935cf49efa8a25c)
Abstract:
Achu is a thick porridge obtained by cooking and pounding taro (Colocasia esculenta) corms and cormels in a mortar. This study was undertaken with the objective of producing precooked taro flour that can be used in the preparation of achu. Taro slices were precooked to times of 0, 20, 45 and 90 min and dried in an air convection oven at varying temperatures of 50, 60, 70 or 80 [degree sign]C before milling into flour which was then analysed for its water absorption capacity (WAC), water solubility index, emulsion activity and stability, bulk density, foam capacity and least gelation concentration (LGC). Achu made from the flours were equally analysed for their relative penetrometric index, bulk density and colour. The results showed that precooking induced significant ($P<0.05$) decrease in foam capacity, penetrometric index, and increase in LGC, emulsion stability and WAC. The drying temperature also induces significant reduction in emulsion capacity and stability, penetrometric index, and increase in LGC, WAC. Long precooking time (>45 min) and drying temperature (>60 [degree sign]C) induced significant reduction of the in-vitro carbohydrate digestibility of taro achu.
Keywords: Taro flour; Food processing; Physico-chemical properties; In-vitro carbohydrate digestibility

D.G. Praveen Kumar, H. Umesh Hebbar, M.N. Ramesh, Suitability of thin layer models for infrared-hot air-drying of onion slices, LWT - Food Science and Technology, Volume 39, Issue 6, August 2006, Pages 700-705, ISSN 0023-6438, DOI: 10.1016/j.lwt.2005.03.021.
(http://www.sciencedirect.com/science/article/B6WMV-4GBWJT3-1/2/9605f4395c1186539a0a9d7e8448618c)
Abstract:
Onion slices were dried under different processing conditions applying infrared radiation assisted by hot air. Drying temperature, slice thickness, inlet air temperature and air velocity were varied to study the drying behavior. Thin layer models such as Page, modified Page, Fick's and Exponential models, which are used to describe the drying kinetics of food materials, were tested for the combination mode drying. The linear plots for Page and modified Page models gave a better fit ($R2=0.980-0.995$) over the other two models ($R2=0.767-0.933$). A combined regression equation developed to predict the drying parameters (k and n) for all the four models gave a fairly good fit ($R2=0.852-0.989$). The modified Page model gave better predictions for drying characteristics over the other models.
Keywords: Combined drying; Hot air; Infrared; Onion; Thin layer

Maria Christina B. de Araujo, Paulo J.P. Santos, Monica F. Costa, Ideal width of transects for monitoring source-related categories of plastics on beaches, Marine Pollution Bulletin, Volume 52, Issue 8, August 2006, Pages 957-961, ISSN 0025-326X, DOI: 10.1016/j.marpolbul.2006.04.008.
(http://www.sciencedirect.com/science/article/B6V6N-4JT8DMN-1/2/a42cdd2c649220db2ae585d7d5e1912d)
Abstract:
Although there is a consensus on the necessity of monitoring solid wastes pollution on beaches, the methods applied vary widely. Therefore, creating, testing and recommending a method that not only allows comparisons of places and periods, but also the detection of source signals, will be important to reach the objectives of the source-prevention principle. This will also allow the optimisation of time, resources, and processing of samples and data. A classification of the items found into specific categories was made according to their most probable source/use (fisheries, food packaging, hazardous, sewage/personal hygiene, beach user, general home). This study tested different widths of sampling transects to be used in the detection of plastics contamination on beaches, until all the categories were significantly represented. Each transect had its total width (50 m) sub-divided into eight intervals of 0-2.5 m; 2.5-5 m; 5-10 m; 10-15 m; 15-20 m; 20-30 m; 30-40 m; and 40-50 m. The accumulated number of categories in the 50 m (up to 2.5 m; up to 5 m and so on) was used to determine the minimal width necessary to qualitatively characterize the area regarding plastics contamination. The diversity of the categories was directly related to the area of the sampling transect. These results indicate that a significant increase in the number of categories in the first intervals tend to stabilize from 15-20 m onwards.
Keywords: Solid wastes; Beach contamination; Plastics on beaches; Sampling methods; Transects; Source-related categories

Adriano G. da Cruz, Sergio A. Cenci, Maria C.A. Maia, Quality assurance requirements in produce processing, Trends in Food Science & Technology, Volume 17, Issue 8, August 2006, Pages 406-411, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.03.003.
(http://www.sciencedirect.com/science/article/B6VHY-4JWFGVY-1/2/942a3d9354b9e71bf1e1152024eef80b)
Abstract:
The increasing consumption of produce has resulted in increasing concern by the food industry with respect to the safety of these products. Quality assurance norms covering all the processing steps, from farm to table, have become obligatory and assume a fundamental role in process innocuousness. This review contains information on the main factors responsible for the elaboration of a quality assurance system for produce plants: good agricultural practices (GAP) and good manufacturing practices (GMP), including the sanitation standard operating procedures (SSOP) and hazard analysis and critical control points (HACCP).

R.A de Wijk, M.E.J. Terpstra, A.M. Janssen, J.F. Prinz, Perceived creaminess of semi-solid foods, Trends in Food Science & Technology, Volume 17, Issue 8, August 2006, Pages 412-422, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.02.005.
(http://www.sciencedirect.com/science/article/B6VHY-4JKHM35-1/2/c19c5224a62a1756835f11351f945f70)
Abstract:
Results of sensory, physiological and physico-chemical studies from our laboratory on perceived creaminess of semi-solids foods are reviewed. Most results stem from studies using model vanilla custard desserts, allowing systematic variation of fat, flavor and thickener properties. The generalizability of the custard results was verified for yogurts, mayonnaises, white sauces and other semi-solid foods. Creaminess sensations could be decomposed into sensations reflecting either properties of the bulk or of the surface of the oral food bolus. Bulk properties related to the rheological properties of the bolus whereas surface properties related to lubrication and flavor

release. Creaminess was inversely related to enzymatic and mechanical induced break-down during oral processing. Starch thickeners generally enhanced creaminess although they suffered from enzymatic break-down compared to non-starch thickeners. It is suggested that the negative effects of break-down were off-set by positive effects of fat migrating to the surface of the bolus. The surfaced fat enhances lubrication and the release of fat-soluble flavors enhance creaminess, especially in low fat starch-based semi-solids. Bulk-related properties were measured by rheological measurements, surface-related properties were measured by friction, and mechanical- and enzymatic break-down properties were measured with a modified rheometer.

Pham Van Hung, Tomoko Maeda, Naofumi Morita, Waxy and high-amylose wheat starches and flours--characteristics, functionality and application, Trends in Food Science & Technology, Volume 17, Issue 8, August 2006, Pages 448-456, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.12.006.
(http://www.sciencedirect.com/science/article/B6VHY-4J3WGB9-2/2/d2247a72b12f5914746de59d9a775331)
Abstract:
Starch is a predominant component of wheat grain. It plays an important role in appearance, structure and quality of food products. Starch consists of two kinds of glucose polymers (amylose and amylopectin) with the ratio of amylose/amylopectin ranging between 25-28 and 72-75%, respectively. The isoforms of granule-bound starch synthase (GBSS) are responsible for the biosynthesis of amylose fraction, whereas amylopectin synthesis is more complicated with concerted activities of the soluble starch synthase together with branching and de-branching enzymes. Recently, waxy (amylose-free) and high-amylose wheats produced through the development of new physicochemical and biological techniques provide the unique starch functional properties. The starches of these wheats have the specific structures and unique characteristics that are believed to enhance the quality of food products. In this review, we will focus on recent advances in the studies of the characteristics of waxy and high-amylose wheat flours and starches and their application for food processing. In addition, we also propose further research ideas for clearer understanding of their characteristics and for their effective utilization.

Chengchu Liu, Yi-Cheng Su, Efficiency of electrolyzed oxidizing water on reducing Listeria monocytogenes contamination on seafood processing gloves, International Journal of Food Microbiology, Volume 110, Issue 2, 15 July 2006, Pages 149-154, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.02.004.
(http://www.sciencedirect.com/science/article/B6T7K-4JXPS0P-4/2/406dd43ae7f88a2dd897d32070d4f0fb)
Abstract:
Food processing gloves are typically used to prevent cross-contamination during food preparation. However, gloves can be contaminated with microorganisms and become a source of contamination. This study investigated the survival of Listeria monocytogenes on gloves and determined the efficacy of electrolyzed oxidizing (EO) water for reducing L. monocytogenes contamination on seafood processing gloves. Three types of reusable gloves (natural rubber latex, natural latex, and nitrile) and two types of disposable gloves (latex and nitrile) were cut into small pieces (4 x 4 cm2) and inoculated with 5-strain L. monocytogenes cocktail (5.1 x 107 CFU/cm2) with and without shrimp meat residue attached to surfaces. L. monocytogenes did not survive well on clean reusable gloves and its populations decreased rapidly to non-detectable levels within 30 min at room temperature. However, high levels of Listeria cells were recovered from clean disposable gloves after 30 min of inoculation. Presence of shrimp meat residue on gloves enhanced the survival of L. monocytogenes. Cells of L. monocytogenes were detected on both reusable and disposal gloves even after 2 h at room temperature. Soaking inoculated gloves in EO water at room temperature for 5 min completely eliminated L. monocytogenes on clean gloves (>

4.46 log CFU/cm2 reductions) and significantly ($p < 0.05$) reduced the contamination on soil-containing gloves when compared with tap water treatment. EO water could be used as a sanitizer to reduce L. monocytogenes contamination on gloves and reduce the possibility of transferring L. monocytogenes from gloves to RTE seafoods.
Keywords: Electrolyzed oxidizing water; Listeria monocytogenes; Food processing gloves; Seafood safety

Leslie Sue Lieberman, Evolutionary and anthropological perspectives on optimal foraging in obesogenic environments, Appetite, Volume 47, Issue 1, July 2006, Pages 3-9, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.02.011.
(http://www.sciencedirect.com/science/article/B6WB2-4K8S5DF-1/2/56be9939ee719febb232141071126bcf)
Abstract:
The nutrition transition has created an obesogenic environment resulting in a growing obesity pandemic. An optimal foraging approach provides cost/benefit models of cognitive, behavioral and physiological strategies that illuminate the causes of caloric surfeit and consequent obesity in current environments of abundant food cues; easy-access and reliable food patches; low processing costs and enormous variety of energy-dense foods. Experimental and naturalistic observations demonstrate that obesogenic environments capitalize on human proclivities by displaying colorful advertising, supersizing meals, providing abundant variety, increasing convenience, and utilizing distractions that impede monitoring of food portions during consumption. The globalization of fast foods propels these trends.
Keywords: Evolution; Diet; Foraging theory; Obesogenic environment

Virginie Parnaudeau, Bernard Nicolardot, Philippe Robert, Gonzague Alavoine, Jerome Pages, Francis Duchiron, Organic matter characteristics of food processing industry wastewaters affecting their C and N mineralization in soil incubation, Bioresource Technology, Volume 97, Issue 11, July 2006, Pages 1284-1295, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.05.023.
(http://www.sciencedirect.com/science/article/B6V24-4GSBGN3-4/2/9157be90598a7a2bc302e16aeb94f04e)
Abstract:
This study aimed at determining food processing wastewater composition factors that regulate their carbon and nitrogen mineralization when added to soil. Twenty three different wastewaters from various food processing industries were characterized by C and N concentrations, liquid and solid physical separation and acid solubility. They were also incubated in a calcareous soil during six months at 28 [degree sign]C.
The C and N concentrations were low but covered a wide range. Carbon and nitrogen were variously distributed in the liquid and solid fractions and much C was present in the acid-soluble fraction in which C to N ratios were low. The C and N mineralization measured during soil incubation covered a wide range of decomposition pathways. Carbon mineralization was linked significantly ($p = 0.05$) with the C to N ratio of the acid soluble fraction and C present in the liquid fraction. N mineralization was significantly correlated ($p = 0.05$) with the organic C to organic N ratio and the C to N ratio of the acid soluble fraction. Multiple factor analysis and clustering also enabled defining clusters which partially overlap the various origins of the wastewaters.
Keywords: Wastewater; Food processing industry; Land spreading; Soil; Organic matter; Carbon; Decomposition; N mineralization; Laboratory incubation; Multiple factor analysis; Clustering

Adele J. Pile, Craig M. Young, The natural diet of a hexactinellid sponge: Benthic-pelagic coupling in a deep-sea microbial food web, Deep Sea Research Part I: Oceanographic Research Papers, Volume 53, Issue 7, July 2006, Pages 1148-1156, ISSN 0967-0637, DOI: 10.1016/j.dsr.2006.03.008.

(http://www.sciencedirect.com/science/article/B6VGB-4K5ST0B-2/2/f4feb599879a47b0f9d8e622deec56f2)
Abstract:
Dense communities of shallow-water suspension feeders are known to sidestep the microbial loop by grazing on ultraplankton at its base. We quantified the diet, rates of water processing, and abundance of the deep-sea hexactinellid sponge Sericolophus hawaiicus, and found that, like their demosponge relatives in shallow water, hexactinellids are a significant sink for ultraplankton. S. hawaiicus forms a dense bed of sponges on the Big Island of Hawaii between 360 and 460 m depth, with a mean density of 4.7 sponges m-2. Grazing of S. hawaiicus on ultraplankton was quantified from in situ samples using flow cytometry, and was found to be unselective. Rates of water processing were determined with dye visualization and ranged from 1.62 to 3.57 cm s-1, resulting in a processing rate of 7.9+/-2.4 ml sponge-1 s-1. The large amount of water processed by these benthic suspension feeders results in the transfer of approximately 55 mg carbon and 7.3 mg N d-1 m-2 from the water column to the benthos. The magnitude of this flux places S. hawaiicus squarely within the functional group of organisms that link the pelagic microbial food web to the benthos.
Keywords: Hexactinellid; Ultraplankton; Suspension feeding

Ronald B. Pegg, Ryszard Amarowicz, William E. Code, Nutritional characteristics of emu (Dromaius novaehollandiae) meat and its value-added products, Food Chemistry, Volume 97, Issue 2, July 2006, Pages 193-202, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.04.002.
(http://www.sciencedirect.com/science/article/B6T6R-4G7NT70-4/2/5e015e23ca957f2ca919accee35ed251)
Abstract:
The objectives of the present study were to ascertain the nutritional value (i.e., macro and microconstituents) of emu (Dromaius novaehollandiae, Latham) meat and a value-added product derived therefrom. The contents of creatine, creatinine and phosphocreatine in fresh emu meat and the impact of processing on these bioactives during the production of jerky were of particular interest. For comparative purposes, a beef counterpart was prepared. The proximate compositional data indicated that the macroconstituents of emu meat and the fabricated jerky product were not so different from their beef analogues. Analysis of the microconstituents in emu samples revealed that the levels of a number of nutritionally important oil- and water-soluble vitamins and minerals were typical of those for red meat species. The creatine content in emu meat (29.3 mg/g dry matter) was similar to that of beef; slightly higher creatine levels were detected, however, in the emu jerky (22.8 mg/g dry matter) compared to its beef counterpart, and these were significant ($P < 0.01$) when the data was analysed on a dry weight basis. This demonstrates a potential for the emu meat snack to be considered as a functional food for athletes looking for performance enhancement, and who are interested in consuming greater quantities of creatine from a natural food source.
Keywords: Emu meat; Jerky; Creatine; Minerals; Vitamins; Ergogenic dietary aid; Functional food; Compositional analysis

Guanghou Shui, Lai Peng Leong, Residue from star fruit as valuable source for functional food ingredients and antioxidant nutraceuticals, Food Chemistry, Volume 97, Issue 2, July 2006, Pages 277-284, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.03.048.
(http://www.sciencedirect.com/science/article/B6T6R-4GDBTPC-2/2/815b37700a5e8a47a8e4769e821927f5)
Abstract:
Our previous study has indicated that star fruit (Averrhoa carambola L.) is a good source of natural antioxidants and that polyphenolics are its major antioxidants. In this study, the residue of star fruit, which is normally discarded during juice drink processing, was found to contain much higher

antioxidant activity than the extracted juice using several methods for assessing antioxidant activity. Under optimized extraction conditions, the residue accounted for around 70% of total antioxidant activity (TAA) and total polyphenolic contents, however only contributed 15% of the weight of whole fruit. Freeze-dried residue powder, which accounted for around 5% of total weight, had total polyphenolic content of 33.2 +/- 3.6 mg gallic acid equivalent (GAE)/g sample and total antioxidant activity of 3490 +/- 310 and 3412 +/- 290 mg l-ascorbic acid equivalent antioxidant capacity (AEAC) or 5270 +/- 468 and 5152 +/- 706 mg trolox equivalent antioxidant capacity (TEAC) per 100 g sample obtained by 2,2'-azino-bis-(3-ethylbenzthiazoline-6-sulfonic acid) free radical (ABTS+) and 1,1-diphenyl-2-picryl-hydrazyl (DPPH) scavenging assays, respectively. It was also found to have 510.3 +/- 68.1 mol ferric reducing/antioxidant power (FRAP) per gram sample. The residue extract also shows strong antioxidant activity in delaying oxidative rancidity of soya bean oil at 110 [degree sign]C. Antioxidant activity and polyphenolic profile of residue extracts were compared with extracts of standardized pyconogenol. High performance liquid chromatography coupled with mass spectrometry (HPLC/MS) shows that major proanthocyanidins in star fruit were different from their isomers in pyconogenol. The high content of phenolics and strong antioxidant activity of residue extracts indicate that residue powder may impart health benefits when used in functional food products and that residue extracts should also be regarded as potential nutraceutical resources in future.
Keywords: Star fruit; Antioxidants; Anti-rancidity; Phenolics; Residue; Functional food; Nutraceuticals

Sandra Casani, Tommas Leth, Susanne Knochel, Water reuse in a shrimp processing line: Safety considerations using a HACCP approach, Food Control, Volume 17, Issue 7, July 2006, Pages 540-550, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.03.002.
(http://www.sciencedirect.com/science/article/B6T6S-4G4PBRG-1/2/14e3dabb8ad9747c2649ac76b36fb189)
Abstract:
The large consumption of water involved in food manufacturing is prompting food processors to optimise the use. Treating and reusing or recycling water within the food plant results in substantial reduction of water use and wastewater production and discharge. If implemented, water reuse should be integrated into existing HACCP programs, and HACCP plans specifically addressed to the actual reuse should be elaborated. This paper evaluates the microbiological safety issues associated with water recycling during the production of shrimps (Pandalus borealis) in brine, and it indicates how the hazards may be effectively controlled using a HACCP approach. Following these procedures, process water recovered from peeling during shrimp processing and treated by means of reverse osmosis could be recycled within the same food unit operation.
Keywords: HACCP; Water reuse; Water recycling; Reverse osmosis; Shrimp processing

Niklas Loren, Lars Hamberg, Anne-Marie Hermansson, Measuring shapes for application in complex food structures, Food Hydrocolloids, Volume 20, Issue 5, July 2006, Pages 712-722, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2005.06.011.
(http://www.sciencedirect.com/science/article/B6VP9-4H2PJTS-7/2/f77f35eb5188b743bc7de1825b18ca7f)
Abstract:
The image analysis method of Fourier shape description is implemented to analyse shaped food microstructural entities, independent of their complexity, because entity shape is an important and nearly unexploited possibility for designing food material properties. The method is described in four steps: the accuracy of image acquisition, representation of the object outline, calculation of components and interpretation of the components, all focusing on colloidal food system applications. Three different common food systems are used to emphasise the possibilities that Fourier shape description offers for food structure design and food processing.

Fourier shape measurements make it possible to quantify, present a typical shape and determine the distribution of shape independently of size of model food suspension consisting of complex shaped entities. This was done in an automatic and replicable way.
The time evolution of entities structured in a flow field during model processing is analysed using Fourier shape descriptors. Graphs of time-dependent, low order single Fourier components allow control of the entity shape during processing.
Differences in the shape of water domains in heterogeneous emulsions are quantified and classified on different length scales using a multivariate hypothesis test.
Keywords: Fourier shape description; Shape measurements; Microstructure; Dispersion properties; Aggregates; Mass transport; Heterogeneous emulsions; Structure evolution; Image analysis

Lingyun Chen, Jane S. Lucas, Jonathan O. Hourihane, Julianne Lindemann, Steve L. Taylor, Richard E. Goodman, Evaluation of IgE binding to proteins of hardy (Actinidia arguta), gold (Actinidia chinensis) and green (Actinidia deliciosa) kiwifruits and processed hardy kiwifruit concentrate, using sera of individuals with food allergies to green kiwifruit, Food and Chemical Toxicology, Volume 44, Issue 7, July 2006, Pages 1100-1107, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.01.005.
(http://www.sciencedirect.com/science/article/B6T6P-4J8D973-2/2/bb0dd5ad4f0dc7af36b2bcc5447052b2)
Abstract: Background
Allergy to green kiwifruit has become common since the fruit was introduced in North America and Europe 30 years ago. Gold kiwifruit, more recently introduced commercially, has been shown to bind IgE from some individuals allergic to green kiwifruit. Hardy kiwifruit is a third species that is now cultivated in North America with potential application as a fresh fruit and in processed foods.Objective
To compare the IgE binding properties of proteins in hardy kiwifruit extract and processed hardy kiwifruit concentrate to each other and to extracts of green and gold kiwifruits to evaluate the potential for allergic cross-reactions.Methods
Sera from kiwifruit-allergic subjects and individuals without allergies to kiwifruit were assayed for IgE binding to soluble proteins in green, gold and hardy kiwifruits and heat-processed concentrate from hardy kiwifruit using immunoblots and direct enzyme-linked immunosorbent assay (ELISA).Results
Marked IgE binding to specific hardy kiwifruit proteins was identified. However, IgE binding to heat-processed hardy kiwifruit concentrate was remarkably lower than to the raw fruit extract.Conclusions
These results suggest that some kiwifruit-allergic individuals may suffer allergic cross-reactions if they consume raw hardy kiwifruit. However, heat processing of the hardy kiwifruit alters allergenic protein structure, dramatically reducing in vitro IgE binding. Processing likely reduces the risk of eliciting an allergic response in those with allergies to raw kiwifruit.
Keywords: Kiwi; Allergen; IgE; Cross-reactivity

Marcia C. Silva, Emmanuel C. Ibezim, Thiago A.A. Ribeiro, Carlos W.P. Carvalho, Cristina T. Andrade, Reactive processing and mechanical properties of cross-linked maize starch, Industrial Crops and Products, Volume 24, Issue 1, July 2006, Pages 46-51, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2006.01.001.
(http://www.sciencedirect.com/science/article/B6T77-4J9N0RN-1/2/4f73aa0ac3121fdb67e92ce2b1245a3c)
Abstract:
There is a growing interest in non-food applications of starches mainly because of their total biodegradability, low cost and world-wide availability. In general, chemical modification reactions

are performed on starches of several sources in order to expand their usefulness. Although cross-linking formation in the presence of sodium trimetaphosphate (STMP) and sodium hydroxide has been already addressed by many authors, the mechanical properties of the resulting products have not been reported. In the present work, maize starch was treated with varied concentrations of STMP and sodium hydroxide at 25% moisture content in an internal mixer. Processing was carried out at a constant rotors speed of 40 rpm for 15 min, at temperatures varying within a limited range. After processing, samples were compression-moulded, conditioned at 28 [degree sign]C and 68% relative humidity for 20 days, and submitted to tensile tests. The effects of the independent variables, concentration of STMP expressed as phosphorous content, and temperature, on specific mechanical energy and mechanical properties of the cross-linked starch materials were analysed by the response surface methodology.
Keywords: Maize starch; Cross-linking; Sodium trimetaphosphate; Reactive processing; Mechanical properties

Vijay K. Juneja, Lihan Huang, Harshvardhan H. Thippareddi, Predictive model for growth of Clostridium perfringens in cooked cured pork, International Journal of Food Microbiology, Volume 110, Issue 1, 1 July 2006, Pages 85-92, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.01.038.
(http://www.sciencedirect.com/science/article/B6T7K-4JXRWX5-1/2/061a0ae4645588d7ef3776fd898288bd)
Abstract:
Mathematical models have been developed and used for predicting growth of foodborne pathogens in various food matrices. However, these early models either used microbiological media or other model systems to develop the predictive models. Some of these models have been shown to be inaccurate for applications in meat and specific food matrices, especially under dynamic conditions, such as constantly changing temperatures that are encountered during food processing. The objective of this investigation was to develop a model for predicting growth of Clostridium perfringens from spore inocula in cured pork ham. Isothermal growth of C. perfringens at various temperatures from 10 to 48.9 [degree sign]C were evaluated using a methodology that employed a numerical technique to solve a set of differential equations. The estimated theoretical minimum and maximum growth temperatures of C. perfringens in cooked cured pork were 13.5 and 50.6 [degree sign]C, respectively. The kinetic and growth parameters obtained from this study can be used in evaluating growth of C. perfringens from spore populations during dynamically changing temperature conditions such as those encountered in meat processing. Further, this model can be successfully used to design microbiologically 'safe' cooling regimes for cured pork hams and similar products.
Keywords: C. perfringens; Cured pork; Cooling; Predictive model

Mark R. Powell, Modeling the frequency and duration of microbial contamination events, International Journal of Food Microbiology, Volume 110, Issue 1, 1 July 2006, Pages 93-99, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.01.034.
(http://www.sciencedirect.com/science/article/B6T7K-4JXPS0P-3/2/a9272623ddec58c47aaa45f2a98afe68)
Abstract:
The frequency and duration of microbial contamination events in the environment in which ready-to-eat (RTE) foods are exposed for processing and packaging is subject to uncertainty and variability. Variability, within-model parameter uncertainty, and uncertainty regarding model selection are formally considered in modeling the frequency and duration of such contamination events by Listeria species. The estimated duration of contamination events represents a case where variability dominates with relatively little uncertainty about parameter values or model form. The estimated frequency of contamination events represents a case where there is not only substantial variability but also considerable within-model parameter uncertainty, as well as some

uncertainty regarding model selection. The Bayesian Information Criterion provides a formal way of taking into account model uncertainty.
Keywords: Risk assessment; Uncertainty; Variability; Censored data; Listeria; RTE food

S. Zhu, A. Le Bail, H.S. Ramaswamy, High-pressure differential scanning calorimetry: Comparison of pressure-dependent phase transition in food materials, Journal of Food Engineering, Volume 75, Issue 2, July 2006, Pages 215-222, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.04.009.
(http://www.sciencedirect.com/science/article/B6T8J-4G9Y43T-2/2/fb04ed647a2154813b51f41931abe1d6)
Abstract:
High-pressure (HP) differential scanning calorimetry (DSC) was used to evaluate and compare the pressure-dependent phase transition behavior of water in different types of food materials (Tylose, potato, salmon fish, pork, and pure water). Small samples (0.48-0.72 g, vacuum-packaged in polyethylene pouches) of these materials were tested through isothermal pressure scan (P-scan, 0.3 MPa min-1) at various sub-zero temperatures. P-scan tests produced reliable information on phase transition and latent heat in test foods at elevated pressure. Polynomial regression equations were established to express numerical relationship between pressure and phase change temperature or latent heat for these test materials. It was indicated that phase transition point (either temperature or pressure) in foodstuffs was significantly depressed ($P < 0.05$) as compared with that in pure water. Latent heat measured during P-scan of food materials had a trend different from that of pure water due to the temperature dependence of ice content in frozen foods. Ice-mass based latent heat showed insignificant difference ($P > 0.05$) from the latent heat between pure water and ice I under pressure. Moisture content was a major factor affecting phase transition and latent heat during pressure processing of foods. As a higher moisture material, potato demonstrated a higher phase transition point and a higher latent heat during a P-scan test at fixed temperature. P-scan technique is a powerful technique to successfully understand pressure-dependent phase transition phenomena in food products during HP processing.
Keywords: High pressure; Calorimetry; DSC; Phase transition; Latent heat; Food

Gauri S. Mittal, Food Processing--Principles and Applications, Trends in Food Science & Technology, Volume 17, Issue 7, July 2006, Page 387, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.01.002.
(http://www.sciencedirect.com/science/article/B6VHY-4J8CY2C-3/2/e9f1ee9b5c73d880be87e7ca938a2f33)

I-sanna Gibbons, Abiodun Adesiyun, Nadira Seepersadsingh, Saed Rahaman, Investigation for possible source(s) of contamination of ready-to-eat meat products with Listeria spp. and other pathogens in a meat processing plant in Trinidad, Food Microbiology, Volume 23, Issue 4, June 2006, Pages 359-366, ISSN 0740-0020, DOI: 10.1016/j.fm.2005.05.008.
(http://www.sciencedirect.com/science/article/B6WFP-4GPW3FX-1/2/f0e341b0df72ad2302b66e5b1870f105)
Abstract:
In 2003, there was a recall of three processed (chicken franks, spice ham and turkey ham ready-to-eat (RTE) meat products by a large processing plant in Trinidad as a result of contamination by Listeria monocytogenes. The study was conducted to investigate the possible source(s) of Listeria contamination of recalled RTE meat products and to determine the prevalence of Listeria spp., Salmonella spp., Escherichia coli and Campylobacter spp. in the products and air within the plant. Raw and processed meat products, as well as food contact surfaces were also tested for Salmonella spp., Listeria spp. and Campylobacter spp. initially after thorough clean-up and close-down of the plant. Faecal and effluent samples from the piggery, in close proximity to the plant, were tested for the presence of Salmonella spp., Listeria spp. and Campylobacter spp. Air

samples and food contact surfaces were negative for the tested organisms. Ten (58.8%) of the 17 effluent samples and 4 (11.8%) of the 34 faecal samples were positive for Campylobacter coli. Of the 11 raw meat products tested, 10 (90.9%) were positive for E. coli and Listeria spp. either singly or in combination. Of the 32 processed RTE products tested, 11 (34.4%) were positive for E. coli, Salmonella spp., Listeria spp. and Campylobacter spp. in combination or singly. Eleven (61.1%) of 18 processed products contained unacceptable levels of aerobic bacteria using international standards. Four months later, following the implementation of recommended cleaning, sanitizing and hygienic practices at the plant, pre- and post-processed products were sampled and Listeria spp. were identified in 4 (80.0%) of the 5 raw products and in 1 of the 5 (20.0%) finished products. Two (40.0%) of the finished products contained unacceptable microbial levels. It was concluded that the close proximity of the piggery to the processing plant was not the probable source of Listeria contamination of the recalled meat products. The data suggested that improved sanitary practices on food contact surfaces and during handling of products, reduced the risk of Listeria spp. and other pathogens studied. The problem at the plant can therefore, be inferred to be due to lapses in good sanitary practices, inadequate heat treatments or the presence of pathogens particularly Listeria in biofilms on different surfaces continuously or occasionally contaminating finished products.
Keywords: Listeria monocytogenes; Enteric pathogens; Ready-to-eat meats; Health risk

Isabelle Schluep Campo, John C. Beghin, Dairy food consumption, supply, and policy in Japan, Food Policy, Volume 31, Issue 3, Evolving Dairy Markets in Asia: Demand Growth, Supply Adjustments and Policy, June 2006, Pages 228-237, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2006.02.009.
(http://www.sciencedirect.com/science/article/B6VCB-4JT38RK-1/2/6361e5f0ec1f737ccd8a1906c777403e)
Abstract:
We investigate Japanese dairy markets. We first provide an overview of consumer demand and how it evolved after World War II. Using historical data and econometric estimates of Japanese dairy demand, we identify economic, cultural and demographic forces that have been shaping consumption patterns. Then we summarize the characteristics of Japanese milk production and dairy processing and policies affecting them. We then describe the import regime and trade flows in dairy products. The paper concludes with policy recommendations of how to reform the Japanese dairy sector.
Keywords: Dairy; Japan; Consumption

Heather Hickey, Bryce MacMillan, Ben Newling, Manoharan Ramesh, Paul Van Eijck, Bruce Balcom, Magnetic resonance relaxation measurements to determine oil and water content in fried foods, Food Research International, Volume 39, Issue 5, June 2006, Pages 612-618, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.12.007.
(http://www.sciencedirect.com/science/article/B6T6V-4JCBN6W-1/2/1bc7f9a19576364824b9a4db7ed24412)
Abstract:
The quality and marketability of many fried food products is a function of the internal distribution of oil and water. French fries, for example, are well received when they are both crisp and moist, but not when they are soggy. A rapid technique for the measurement of local oil and water content is therefore highly desirable to guide the development and processing of fried food materials.
Time-domain nuclear magnetic resonance (TD-NMR) has proven to be a quick, reproducible, accurate, and non-invasive technique, which is particularly well suited to measurements of oil and moisture content. Nuclear spin-spin relaxation times (T2) are an excellent probe of molecular mobility, which in turn can be directly correlated to moisture content.

In this work, a precursor to spatially resolved measurements, we measure T2 in a model fried food crust sample as a function of moisture level. We observe multi-exponential behavior, which we assign to specific liquid constituents. We find a direct correlation between the component weightings and the known oil and water contents.
By systematically varying the moisture level of the sample, we explore the nature of water uptake in these materials. Absorption is modeled with a modified BET sorption isotherm.
These results provide a basis upon which magnetic resonance imaging (MRI) techniques can be applied to investigate cooked starch food crusts.
Keywords: Chip; French fry; Fried crust; Magnetic resonance; Spin-spin relaxation; Sorption isotherm

K. Asteriadou, A.P.M. Hasting, M.R. Bird, J. Melrose, Computational Fluid Dynamics for the Prediction of Temperature Profiles and Hygienic Design in the Food Industry, Food and Bioproducts Processing, Volume 84, Issue 2, June 2006, Pages 157-163, ISSN 0960-3085, DOI: 10.1205/fbp.04261.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVMX-9/2/1099004e5ac64fa02f7e195da66543f8)
Abstract:
Many factors need to be considered to ensure that food process lines consistently deliver microbiologically safe products. These factors include process and equipment design, and in particular the interaction between the product and the equipment geometry. Computational fluid dynamics (CFD) has recently been used within the food industry in a number of applications. In this work a commercial finite volume CFD code, FLUENT, has been used to predict those parameters critical to the prediction of velocity and temperature profiles for low viscosity fluids in typical, complex equipment geometries and compared these with experimental data. A comparison of the temperature distribution using predictive modelling and experiments is encouraging, and qualitatively satisfactory and reliable for laminar and turbulent flows. Application of this approach will enable the interaction between food products and equipment geometries to be predicted, and provide an improved method of assessing the implications for the microbiological safety of foods.
Keywords: hygienic design; modelling; CFD; turbulence; food processing; food safety

Christoph Hartmann, Katrin Mathmann, Antonio Delgado, Mechanical stresses in cellular structures under high hydrostatic pressure, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 1-12, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.06.005.
(http://www.sciencedirect.com/science/article/B6W6D-4GX6J3N-4/2/a1b53424638395c3814659d24ecb26db)
Abstract:
Mechanical stresses and deformation of cellular structures due to the application of high hydrostatic pressure (HHP) is analysed for two cases. In the first case, a liquid-filled spherical shell with linear elastic material properties is considered as first approximation of a biological cell. The theoretical analysis reveals the existence of severe non-hydrostatic mechanical stresses in the wall of the structure.
As second case, a nonlinear model of a yeast cell (Saccharomyces cerevisiae) under high hydrostatic pressure is assessed by use of the finite-element method. It is observed that hydrostatic stress conditions are preserved in the interior part of the cell, while non-hydrostatic stress is encountered in the cell wall. There, von-Mises stress reaches its critical value upon failure (70 +/- 4 MPa) at a pressure load between 415 MPa and 460 MPa. This confirms observations of cell wall damage at this pressure as reported earlier by other authors.Industry Relevance of the Content of Manuscript 042405344

The current manuscript considers mechanical stresses included in biological cellular structures when exposed to high hydrostatic pressure. It reveals that current idea about the existence of a hydrostatic stress state in any structure under hydrostatic pressure is incorrect.
By use of a linear analytical model and a nonlinear numerical model, it can be shown that heterogeneous mechanical stresses occur in solid bodies as long as latter consist of materials with different mechanical properties.
Since this result can be generalised to biological and non-biological macroscopic mechanical structures, the paper is, to some extent, relevant for industrial applications. For example, food packages such as bottles, cans and soft pouches represent such structures consisting of different materials. They might be exposed to heterogeneous mechanical stress leading to damage during high-pressure processing.
The authors intend to do research on mechanical stresses in natural and industrial food packages during high-pressure treatment in the future.
Keywords: High-pressure processing; Mechanical stress; Cell; Modelling; Simulation

Amaral Sequeira-Munoz, Dominique Chevalier, Alain LeBail, Hosahalli S. Ramaswamy, Benjamin K. Simpson, Physicochemical changes induced in carp (Cyprinus carpio) fillets by high pressure processing at low temperature, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 13-18, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.06.006.
(http://www.sciencedirect.com/science/article/B6W6D-4JFPN4C-2/2/066ec0f62a72335fc5fc15c43aadddb6)
Abstract:
Raw carp fillets (Cyprinus carpio) were vacuum packed and pressurized at 100, 140, 180 and 200 MPa at 4 [degree sign]C for 15 and 20 min, and then monitored for changes in the lipid fraction, color and electrophoretic profiles. The values of thiobarbituric acid (TBA) reactive substances in the samples increased with pressure and pressurization time. Similar results were obtained for free fatty acids (FFA) levels formed as a result of pressure treatment. The CIE color values, i.e., L* (lightness), a* (redness) and b* (yellowness) of the carp fish fillets also increased with pressure and pressurization time, and the results obtained attest to the importance of establishing treatment conditions for various fish species when processing these food products in order to minimize changes in their appearance and flavor characteristics.Industrial relevance
High pressure processing is finding increasing use in the food industry because of its relative advantages versus other food processing methods in eliciting minimal changes in the flavor and nutritional qualities of the final product. High pressure treatment is able to achieve this via its effects on the two causative agents of food spoilage, namely autolysis as well as microbial growth and metabolism. High pressure processing has been used commercially to produce food products such as raw oysters, guacamole, and ham and fruit juices in the US; and to produce jams, jellies, fish and meat products, salad dressing, ham, fruit juices and yogurt in Europe and Japan. However, in spite of the notion that high pressure processing results in minimal changes in food products, it is also common knowledge that the technology induces important changes in the texture and appearance of raw fish would be influenced by temperature at which the pressurize treatment was conducted. This paper illustrates the changes induced in raw carp flesh by pressurization at different temperatures.
Keywords: High-pressure processing; TBA values; Color and lipid changes; Myofibrillar proteins; Carp (Cyprinus carpio) fish fillets

G. Urrutia Benet, N. Chapleau, M. Lille, A. Le Bail, K. Autio, D. Knorr, Quality related aspects of high pressure low temperature processed whole potatoes, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 32-39, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.09.002.

(http://www.sciencedirect.com/science/article/B6W6D-4HM82N2-1/2/a7d207c4cd233b386c3a6975c3fa7467)
Abstract:
The optimization of freezing and thawing paths for faster processes, leading to better quality and safety of processed food products, was studied with whole potatoes. Microstructure of processed products was examined through a light microscopy based method on the embedding of the samples in a resin. Colour of samples (visual appearance and spectrometric measurements) and drip loss after the thawing treatment were also examined. A processing time reduction for pressure-induced thawing at pressure levels of 290 MPa has been demonstrated, taking advantage of the existence of a solid ice I metastable phase in the domain of ice III. This time reduction is a direct consequence of the increase of the temperature gradient between sample and heating medium.Industrial relevance
An already well established market for High-Pressure treated products, mainly concerning pasteurization, still shows no products commercialized for sub-zero temperature processes. High-Pressure Low-Temperature (HPLT) treatment of food products is still a non-industrialized technology. The quality and safety maintenance of treated foods (as shown in this paper), together with the existing High-Pressure industrial equipment and market (at room or high temperatures) clearly demonstrate the great opportunity of HPLT processing of foods. This paper shows an example of HPLT treated foods in a pilot scale, as a first scale-up attempt.
Keywords: HPLT processing; Pilot scale; Metastable phases

Alexandre Espachs-Barroso, Ann Van Loey, Marc Hendrickx, Olga Martin-Belloso, Inactivation of plant pectin methylesterase by thermal or high intensity pulsed electric field treatments, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 40-48, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.07.002.
(http://www.sciencedirect.com/science/article/B6W6D-4HCDJVN-1/2/e40992c3e5d496dded01af129ee03016)
Abstract:
A comparative study between new and traditional food preservation technologies was performed on pectin methylesterase (PME) inactivation from different plant sources. PME was extracted from carrots, tomatoes, bananas and oranges and was purified by affinity chromatography. Its inactivation was investigated during high intensity pulsed electric fields (HIPEF) and thermal treatments.
Thermal treatment was performed at temperatures from 54 [degree sign]C to 81 [degree sign]C and up to 120 min treatment time. PME inactivation was adequately described by a first-order kinetic model for PME from bananas, carrots and tomatoes, whereas a biphasic model described adequately thermal inactivation of orange PME. The thermal stable fraction of orange PME was the least sensible to heat and carrot PME was the most thermally sensitive.
HIPEF treatment consisted of 40-[mu]s-square-wave pulses applied up to a total treatment time of 1.6 ms at 0.5 or 5 Hz and an electric field between 13.2 and 19.1 kV/cm. The higher the electric field, total treatment time or pulse frequency the higher the degree of PME inactivation from all sources. Maximum enzyme inactivation was: 87% for orange and tomato PME, 83% for carrot PME and 45% for banana PME at the most intense conditions.Industrial relevance
Increasing studies show that using high intensity pulsed electric fields technology for fruit juices pasteurisation is feasible in the near future. A critical point on the fruit juice production and preservation is the pectin methyl esterase activity control. Consequently, the effect of HIPEF on PME activity has a great industrial relevance. This paper shows high inactivation percentages of PME from different plant sources with a HIPEF treatment carried out at moderate temperatures (55-65 [degree sign]C) and offers an attractive alternative to the traditional heat treatment.
Keywords: Pectin methylesterase; Thermal treatment; Non-thermal processing; Pulsed electric fields

Md. Kamrul Haque, Yrjo H. Roos, Differences in the physical state and thermal behavior of spray-dried and freeze-dried lactose and lactose/protein mixtures, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 62-73, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.12.004.
(http://www.sciencedirect.com/science/article/B6W6D-4HNSG8M-1/2/d87e6adc0c77af499c55d674eb80891d)
Abstract:
The physical state and thermal behavior of dried food ingredients are important in the control of processing and storage stability of such materials. The physical structures of spray-dried and freeze-dried anhydrous and crystalline lactose, lactose/whey protein isolate (WPI), lactose/Na-caseinate and lactose/gelatin mixtures were observed by scanning electron microscopy (SEM). Glass transition, Tg, and instant crystallization temperatures, Tcr, were determined using differential scanning calorimetry (DSC). Particles in spray-dried amorphous lactose were spherical, and in lactose/protein mixtures it was also spherical with some dents. Freeze-dried lactose and lactose/protein mixtures resembled pieces of broken glass. Crystals formed from spray-dried lactose were tomahawk-like but those formed from freeze-dried lactose had needle-like or rod-like structures. Tg and Tcr of freeze-dried lactose and lactose/protein mixtures were slightly higher than those of spray-dried lactose and lactose/protein mixtures at corresponding water contents. But Tcr of lactose/Na-caseinate and lactose/gelatin mixtures were lower in freeze-dried than in spray-dried materials. Time-dependent lactose crystallization was observed at RVP 44.1% and above in both dehydrated materials, except in freeze-dried lactose/Na-caseinate and lactose/gelatin. These results indicated that freeze-dried and spray-dried materials have different physical and thermal behavior suggesting that different microstructures and product properties are obtained with different drying methods.Industrial relevance
Lactose is often applied as a mixture with other sugars and proteins in the food industry. Hence, understanding the physical state and thermal behavior of different dehydrated ingredients has a great importance in the development of proper processing and self-life control procedures for such ingredients and products.
This manuscript provides some information about storage stability of lactose in the presence of proteins under various moisture conditions. Data on water sorption and glass transition can be used to predict changes during processing and storage of spray-dried and freeze-dried lactose and lactose/protein mixtures. The crystallization data allow prediction of crystallization behavior, as a physical state-dependent phenomenon, and therefore, stability of lactose and lactose containing food products.
Keywords: Spray-drying; Freeze-drying; Scanning electron microscopy; Glass transition; Crystallization

Schuster-Gajzago Ildiko, Kiszter Andrea Klara, Toth-Markus Marianna, Barath Agnes, Markus-Bednarik Zsuzsanna, Czukor Balint, The effect of radio frequency heat treatment on nutritional and colloid-chemical properties of different white mustard (Sinapis alba L.) varieties, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 74-79, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.06.001.
(http://www.sciencedirect.com/science/article/B6W6D-4JRKVNY-1/2/05179ca50f263ef358a659b4df9d7b67)
Abstract:
Mustard (Sinapis alba) seed has an advantageous chemical composition such as its protein content and fairly well-balanced amino acid composition, rich in dietary fibre and natural antioxidants. In addition to its nutritional value, mustard seed flour offers rather unique functional properties; therefore it could be taken into consideration as potential component of many food products.

The limiting factor of use of mustard seed in human food applications or animal feed formulation has been its typical spicy flavour and the presence of a significant amount of erucic acid.
A mild and low energy cost heat treatment was elaborated and patented for heat inactivation of myrosinase enzyme, so the characteristic, pungent flavour was eliminated by radio frequency heat treatment.
Chemical and colloid-chemical properties of traditional varieties and a low erucic acid content mustard genotype were compared in this experiment. This new genotype showed the same chemical composition as the traditional varieties except of its advantageous fatty acid composition. This genotype is recommended for human consumption and animal feeding.
Keywords: Mustard seed; Radio frequency heat treatment; Myrosinase activity; Glucosinolate content; Pungent flavour; Protein content; Amino acid composition; Essential amino acids; Fatty acid composition; Erucic acid; Phenolic content; Free radical scavenging activity; Colloid-chemical properties; White mustard has been used effectively for food and medical applications, one of the limiting factors for human use of mustard products is the spicey flavour produced by myrosinase enzyme activities. The use of radio frequency energy as an emerging low-cost environmentally friendly thermal process for enzyme inactivation proved effective to produce a product with acceptable sensory properties. Thermal processing of a low erucic acid content mustard genotype resulted in a product recommendable for use for human and animal consumption.

V.P. Valdramidis, A.H. Geeraerd, K. Bernaerts, J.F. Van Impe, Microbial dynamics versus mathematical model dynamics: The case of microbial heat resistance induction, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages 80-87, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.09.005.
(http://www.sciencedirect.com/science/article/B6W6D-4JDN6FB-3/2/cfd2ecc37fd47ac6002e5e041ab0d8d8)
Abstract:
Quantifying the microbial inactivation during a thermal treatment is a main objective in the food industry in order to design a microbiologically safe process and to avoid fail-dangerous or, on the contrary, overly conservative heat processes. This work focuses on the effect of different heating regimes, i.e., with a heating rate of 0.15, 0.20, 0.40, 0.55, 0.82, and 1.64 [degree sign]C/min, from 30 to 55 [degree sign]C, on the (induced) heat resistance of Escherichia coli K12 MG1655. Dynamic inactivation experiments performed under realistic time-temperature conditions are used as a vehicle to validate pertinent modelling and microbial information originating from static inactivation experiments and comprehensive literature observations.
The influence of the thermal process conditions on the microbial heat resistance is verified based on a working hypothesis for the performed microbial predictions. Microbial heat resistance is utmost perceived in the lowest heating rates considered (with a corresponding come-up time higher than 30.61 min).
Thermal inactivation of microorganisms in foods has been used and optimized effectively since centuries. However, even more recent developments such as the D-value concept are based on the assumption that the heat resistance of microorganisms measured under isothermal conditions is constant and also applicable to foods heated and cooled relatively slow. This highly relevant paper is based on the hypothesis that heating rates during processing can be an essential factor for heat resistance adaption of microorganisms (using E. coli as a model) and uses a dynamic microbial modelling approach for considering microbial adaptive responses. This approach is an important step towards avoiding process induced adaptive responses allowing pathogenic microorganisms to persist during storage of foods.
Keywords: Predictive microbiology; Escherichia coli; Dynamic thermal inactivation; Microbial heat resistance; Non-linear model

Barbara Burlingame, Food processing and the fate of food components, Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Page 251, ISSN 0889-1575, DOI: 10.1016/j.jfca.2006.02.008.
(http://www.sciencedirect.com/science/article/B6WJH-4JJ87TN-1/2/b88c2f41c944da5f9ec633fc4a22daf2)

Emilia Leskova, Jana Kubikova, Eva Kovacikova, Martina Kosicka, Janka Porubska, Kristina Holcikova, Vitamin losses: Retention during heat treatment and continual changes expressed by mathematical models, Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Pages 252-276, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.04.014.
(http://www.sciencedirect.com/science/article/B6WJH-4J9MSTX-1/2/548475ad576e8f8d47edf9ee7638342f)
Abstract:
Processing and cooking conditions cause variable losses of vitamins. Losses vary widely according to cooking method and type of food. Degradation of vitamins depends on specific conditions during the culinary process, e.g., temperature, presence of oxygen, light, moisture, pH, and, of course, duration of heat treatment. The most labile vitamins during culinary processes are retinol (vegetable boiling, 33% retention), vitamin C (the most damaging factors are cooking and oxidation), folate (leaching into the cooking water, 40% retention), and thiamin (cooking, retention 20-80%). Niacin, biotin, and pantothenic acid are quite stable, but information on some vitamins, especially vitamins D and K, is incomplete. The percentage losses of some nutrients in foods after cooking treatment were frequently reported: not continual changes during heat treatment, only modifications at the beginning and after heat treatment. Changes of nutrients in food during the culinary process have not yet been sufficiently investigated. A few authors have attempted to summarize the kinetic data which can be used to describe the time-temperature effect on nutrients.
Keywords: Vitamin losses; Thermal degradation; Kinetic models

S. Seena, K.R. Sridhar, A.B. Arun, Chiu-Chung Young, Effect of roasting and pressure-cooking on nutritional and protein quality of seeds of mangrove legume Canavalia cathartica from southwest coast of India, Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Pages 284-293, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.05.004.
(http://www.sciencedirect.com/science/article/B6WJH-4J9N0RR-1/2/8693b6543198199905bc7c7fd0325085)
Abstract:
Raw and processed (roasted and pressure-cooked) seeds of mangrove wild legume (Canavalia cathartica) of southwest coast of India were evaluated for nutritional and antinutritional qualities. The seeds consist of 28-32% proteins and 1600-1630 kJ/100 g of energy. A significant difference was seen between the proximate composition of raw and pressure-cooked seeds ($P<0.05$, t-test). Among the minerals, potassium was highest (240-828 mg/100 g) followed by phosphorus (84-120 mg/100 g) and sodium (21-41 mg/100 g). Globulins (18.2%) constituted the bulk of the seed proteins followed by albumins (7.3%) as in most of the legumes. Unlike the pressure-cooked seeds, SDS-PAGE revealed three protein bands in roasted seeds (51.4, 39 and 33.1 kDa) indicating partial or complete denaturation. The essential amino acids (EAA): cystine+methionine of processed seeds exceeded than that of rice; cystine+methionine, tyrosine+phenylalanine and lysine of the roasted seeds and cystine+methionine of pressure-cooked seeds were higher than FAO/WHO pattern. Threonine, valine and isoleucine of roasted seeds were comparable to FAO/WHO pattern, so also valine, isoleucine and lysine of pressure-cooked seeds. The carbohydrates, polyunsaturated/saturated fatty acid ratio and sulphur-amino acids were higher

than soybeans. The raw seed flours were devoid of tannins and trypsin inhibitors, in addition, thermal processing decreased total phenolics and hemagglutinins. Growth and nitrogen balance studies in rats were performed to determine food efficiency ratio, protein efficiency ratio, net protein retention (NPR), protein retention efficiency (PRE), true digestibility, biological value (BV) and net protein utilization (NPU) of roasted and pressure-cooked seeds. Pressure-cooked seeds showed better biological indices than roasted seeds. Except for NPR, PRE, BV and NPU, rest of the parameters analyzed for protein quality was significantly different between roasted and pressure-cooked seed diet ($P<0.05$, t-test). Our study clearly indicated that Canavalia cathartica seeds of mangroves possess high protein and EAA. Even though domestic roasting and pressure-cooking partially detoxified con A-like lectins or hemagglutinins, improved methods of processing are essential to maximize the quality of protein with minimum loss of seed nutrients. This is the first study on the biochemical and protein quality evaluation of mangrove bean, Canavalia cathartica and warrants its conservation and utilization as a future potential protein source for humans and or livestock.
Keywords: Protein quality; Essential amino acids; Lectins; Seeds; Roasting; Pressure-cooking; Canavalia cathartica; Legume; Mangroves

T. Agbor-Egbe, I. Lape Mbome, The effects of processing techniques in reducing cyanogen levels during the production of some Cameroonian cassava foods, Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Pages 354-363, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.02.004.
(http://www.sciencedirect.com/science/article/B6WJH-4J9X2W2-2/2/2fab30b71af8343c1f604aa13e06b44c)
Abstract:
This study investigated the effects of cassava processing techniques in reducing cyanogen levels to low levels during the production of some Cameroonian foods (baton de manioc, fufu and gari). The processing techniques used for each of the foods did not vary in details from one processor to the other, and no considerable differences were found in neighbouring villages. They were highly effective in substantially reducing mean total cyanogen contents (197.3-951.5 mg HCN equivalent/kg) to low levels (1.1-27.5 mg HCN equivalent/kg). In spite of the different cassava varieties used for processing, similar mean reduction levels (97.1-99.8%) in total cyanogens were obtained by the processors: 98.8%, 97.1% and 99.7% for baton de manioc, fufu and gari, respectively. With regard to the greatest changes in total cyanogens, the most important techniques were those that maximise root tissue disintegration causing marked decreases in both linamarin and pH levels, which coincided with significant increases in cyanohydrin. The residual cyanogens were in the form of cyanohydrin, which were partially removed during post-fermentation processes.
Keywords: Processing techniques; Cyanogens; Baton de manioc; Fufu; Gari

Jianmei Yu, Mohamed Ahmedna, Ipek Goktepe, Jian Dai, Peanut skin procyanidins: Composition and antioxidant activities as affected by processing, Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Pages 364-371, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.08.003.
(http://www.sciencedirect.com/science/article/B6WJH-4J9MSTX-2/2/8fc5e6e93f07cb1ebbdbbd46934ada62)
Abstract:
Peanut skin was removed by direct peeling, blanching, and roasting. Total phenolics (TPs), total antioxidant activity (TAA) and free radical scavenging capacity of peanut skin extracts were determined. The composition of ethanolic extracts of peanut skin obtained from each processing method was determined by LC-MS and HPLC. Peanut skin processing methods significantly affected total extractable phenolics and their composition. Roasting had limited effects on

concentration of TPs while blanching caused 89% loss of TPs. TPs in directly peeled, roasted, and blanched peanut skins were 130, 124, and 14.4 mg/g dry skin, respectively. Catechins, A-type and B-type procyanidin dimers, trimers and tetramers in chemically purified peanut skin extracts were identified by LC-MS. Total catechins, procyanidin dimers, trimers and tetramers in directly peeled peanut skin were 16.1, 111.3, 221.3 and 296.1 mg/100 g, respectively, versus 8.8, 143.5, 157.5 and 203.9 mg/100 g, respectively, in roasted dry skin. TAAs and free radical scavenging capacities of peanut skin extracts were all higher than those of Trolox and Vitamin C at equivalent concentration. Peanut skin, a by-product of the peanut processing industry, was found to contain potent antioxidants and could provide an inexpensive source of antioxidants for use as functional ingredients in foods or dietary supplements.
Keywords: Peanut skin; Catechins; Procyanidins; LC-MS; Antioxidants; Antioxidant activity; Free radical scavenging

R. Tahvonen, R.M. Hietanen, J. Sihvonen, E. Salminen, Influence of different processing methods on the glycemic index of potato (Nicola), Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Pages 372-378, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.10.008.
(http://www.sciencedirect.com/science/article/B6WJH-4J9X2W2-4/2/cd35e4d2c86d7a29728315938c9d1556)
Abstract:
Potato is a food which yields very variable glycemic responses. It makes a major contribution to total starch intake and the share of processed potato products is growing. The aim of the study was to determine the effects of processing and storage on the glycemic indices (GIs) of industrially processed potato products.
Two groups (11 and 10 volunteer subjects) attended a glucose tolerance test and glycemic response test of 4 and 3 processed potato products, respectively. GIs of different potato products were calculated for each subject using their own glucose tolerance test and glycemic responses for test meals and averages calculated for each product.
GIs of freshly prepared potato products were high: steam boiled potatoes 104+/-39, oven-baked casserole 95+/-30 (carbo-peeled sliced potato) and mashed potatoes 106+/-42. GIs of cooled and cold stored potato products were intermediate, potato cubes served cold 76+/-32 and cooled, reheated oven-baked casseroles 73+/-25 (carbo-peeled sliced potato), 75+/-17 (carbo-peeled mashed potato) and 81+/-28 (steam-peeled mashed potato). Cooling and cold storage decreased GIs significantly (steam boiled potatoes vs. steam boiled potato cubes (P=0.01), freshly served casserole made of sliced potatoes vs. casserole cooled, cold stored and reheated P=0.01).Conclusion
Cooking method, peeling method, or slicing or mashing did not affect the GIs. Cooling and cold storage, despite reheating, lowered GIs of potato products by about 25%.
Keywords: Glycemic index; Glycemic load; Potato; Oral glucose tolerance test

Nelofar Athar, Allan Hardacre, Grant Taylor, Suzanne Clark, Rebecca Harding, Jason McLaughlin, Vitamin retention in extruded food products, Journal of Food Composition and Analysis, Volume 19, Issue 4, After Processing: The Fate of Food Components, June 2006, Pages 379-383, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.03.004.
(http://www.sciencedirect.com/science/article/B6WJH-4J9X2W2-3/2/5eeaa1a81c9421f3d85894b053eb8b25)
Abstract:
Crisp extruded snack food like products were produced from a range of cereal products using a short barrel, single screw snack food extruder. The retention of B group vitamins during extrusion processing was compared for the different cereal grains and under different extrusion conditions. This work showed that short barrel extruders used for snack food production retain between 44%

and 62% of the B group vitamins. This is considerably higher than the 20% retention for maize reported previously for long barrel extruders. The stability of the vitamins was similar, with riboflavin and niacin having the highest stability. Pyridoxine was stable in maize, but less so in oats and the maize+pea ingredients. Thiamin was the least stable during extrusion. It is concluded that short term high-temperature cooking of extruded snacks allows the retention of higher levels of heat labile B vitamins than the longer time and lower temperature cooking methods used in modern snack food extruders.
Keywords: Extrusion; Nutrient retention

Miroslav Kubasek, Milan Houska, Ales Landfeld, Jan Strohalm, Jiri Kamarad, Rudolf Zitny, Thermal diffusivity estimation of the olive oil during its high-pressure treatment, Journal of Food Engineering, Volume 74, Issue 3, June 2006, Pages 286-291, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.03.019.
(http://www.sciencedirect.com/science/article/B6T8J-4G1WXX7-2/2/b9cac760a664314ba250ba1d36192795)
Abstract:
This contribution concerns cooling of olive oil under the conditions of its treatment with high pressure and the estimation of its thermal diffusivity by the means of numerical analysis of the experimental data of the temperature drop at the time of holding at the pressure. The oil was placed in a small container in the middle of a high-pressure device chamber. The device chamber was filled with pressured water. The numerical method of the finite elements in the programme environment COSMOS was used for modelling the oil cooling without considering the free convection in the oil. During the calculation, the input thermal diffusivity dependence on the temperature was being purposely varied for so long until the reasonable agreement of the computed and measured temperature decays of the olive oil on the time was reached. It proved that thus gained temperature dependences of the apparent thermal diffusivity are a function of the starting temperature of the experiment and are therefore influenced by the free convection in the oil and hence values gained are not values of the physical property of the material. The experiment to estimate the real thermal diffusivity of the oil for the steady state at the end of the experiment from these dependences when the free convection already disappears was done. This work shows that it is necessary to take into consideration not only the heat conduction, but also the free convection when modelling the temperature history of the viscous liquid foods during high-pressure treatment.
Keywords: Olive oil; Food processing; High pressure; Thermal diffusivity

S. Salo, H. Ehavald, L. Raaska, R. Vokk, G. Wirtanen, Microbial surveys in Estonian dairies, LWT - Food Science and Technology, Volume 39, Issue 5, June 2006, Pages 460-471, ISSN 0023-6438, DOI: 10.1016/j.lwt.2005.03.008.
(http://www.sciencedirect.com/science/article/B6WMV-4G3KC2S-2/2/7495631f98049eb9a6178316a55dbbf3)
Abstract:
Milk contains low numbers of bacteria when it is milked from healthy cows. Drinking and fodder places in the cow shed, milking machines, utensils and equipment at farms, during transportation and in processing may add contaminants to the milk. The aim of this study was to investigate hygiene at the dairies, to find critical points where special attention or improved cleaning is needed by using various microbial sampling methods and by determining the occurrence of Bacillus cereus, Mycobacterium spp. and Listeria monocytogenes. Surfaces were examined with Hygicult(R) and Rida(R)Count. DryCult(R) TPC total bacterial count was used for the determination of microbial counts in liquid samples. The detection of L. monocytogenes was performed according to ISO 11290-1 using the API Listeria test in the identification. The detection of Mycobacteria spp. was performed using Middlebrook 7H10 agar, Mycobacterium tubes 1 and 2

with confirmation based on Ziehl-Neelsen staining. Detection of B. cereus was performed according to ISO 7932 using [beta]-haemolysis on sheep blood agar and API 50CHB test in the identification. These results showed that food contact surfaces were mostly clean from microbes, but the noncontact surfaces were often contaminated with enterobacteria, fungi and aerobic bacteria.
Keywords: Dairy hygiene; Microbial sampling; Spoilage microbes; Pathogens; Food contact surfaces

S.F. O'Keefe, H. Wang, Effects of peanut skin extract on quality and storage stability of beef products, Meat Science, Volume 73, Issue 2, June 2006, Pages 278-286, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.12.001.
(http://www.sciencedirect.com/science/article/B6T9G-4J6X3W7-1/2/9e2f1700d87245543ce09092d66bb66f)
Abstract:
Peanut skins are a low-value byproduct of peanut processing operations. They have been found to contain significant levels of natural antioxidants, but their antioxidant activity in muscle foods is unknown. The effects of peanut skin extracts on oxidation (TBARS) and color (CIE L* a* b*) was studied in ground beef and ground beef with added salt, phosphate (STP) and nitrite/erythorbate. Cooking loss, microbial growth, aroma acceptability and texture were also examined. The most significant reduction in oxidation was in ground beef or samples with salt, followed by phosphate (STP) or nitrite/erythorbate. Because of their low effective concentrations (200 ppm), the extracts did not cause color change ($P > 0.05$) of the products indicated by CIE L* a* b* value. The extracts had no effect ($P > 0.05$) on sensory aroma. The phenolic extract from peanut skin had no effect ($P > 0.05$) on the cooking loss of the ground beef as well as the cured and uncured formulated products. The microbial growth in fresh ground beef was not affected ($P < 0.05$) by the phenolic extract.
Keywords: Phenolic compounds; Antioxidants; Oxidation; Peanut skins; Ground beef; Color; Cooking loss

Atle M. Bones, John T. Rossiter, The enzymic and chemically induced decomposition of glucosinolates, Phytochemistry, Volume 67, Issue 11, June 2006, Pages 1053-1067, ISSN 0031-9422, DOI: 10.1016/j.phytochem.2006.02.024.
(http://www.sciencedirect.com/science/article/B6TH7-4JS1MYG-1/2/df3f73da0222888b99047e72094fe914)
Abstract:
While the myrosinase-glucosinolate system has been reviewed in recent years by a number of authors, little attention has been paid to the enzymic and non-enzymic degradation of glucosinolates. Non-enzymic degradation processes are particularly important in the processing of brassica vegetables with respect to both flavour and in the role of glucosinolates as precursors of anticancer compounds in the diet. This review highlights early empirical work on glucosinolate degradation along with more recent aspects related to current research on mechanism of glucosinolate degradation in plants, microbes and animals.
Keywords: Myrosinase (E.C. 3.2.1.147); [beta]-d-thioglucosidase; Epithiospecifier protein; Thermal and chemical degradation; Microbial products; Review

Juliet A. Gerrard, The Maillard reaction in food: Progress made, challenges ahead--Conference Report from the Eighth International Symposium on the Maillard Reaction, Trends in Food Science & Technology, Volume 17, Issue 6, June 2006, Pages 324-330, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.11.011.
(http://www.sciencedirect.com/science/article/B6VHY-4J2TVJD-1/2/12eb022ca81fbbf4b1180f16ae5bc265)

Abstract:
The Eighth International Symposium on the Maillard reaction marked the 25th anniversary of the first symposium and saw a change in focus away from food processing aspects, towards health and nutrition. In the medical arena, research into aging and diabetes has an increasingly broad scope, including human health, disease and nutrition. Thus, the boundaries between food scientists and medical researchers are becoming increasingly blurred, and a common goal of establishing the physiology and fate of Maillard reaction products absorbed from the diet or generated in vivo has emerged. This review highlights some new directions in Maillard research of relevance to food scientists that emerged during the conference.

John F. Kennedy, Parmjit S. Panesar, G.V. Barbosa-Canovas, M.S. Tapia and M.P. Cano, Editors, Novel Food Processing Technologies, CRC Press/Taylor and Francis Group, Boca Raton, FL/USA (2005) (xiv+692 pp., [pound sign]99.00, ISBN 0-8247-5333-X)., Carbohydrate Polymers, Volume 64, Issue 3, 30 May 2006, Pages 488-489, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2005.10.007.
(http://www.sciencedirect.com/science/article/B6TFD-4J5T5XX-8/2/ef96055680b59ac40d014458c8e13e21)

H.M. Blasel, P.C. Hoffman, R.D. Shaver, Degree of starch access: An enzymatic method to determine starch degradation potential of corn grain and corn silage, Animal Feed Science and Technology, Volume 128, Issues 1-2, 28 May 2006, Pages 96-107, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2005.08.018.
(http://www.sciencedirect.com/science/article/B6T42-4HCMSFS-1/2/eb479a49a260b7e3f0bd301fab4a08ba)
Abstract:
Starch supplied from corn grain or corn silage is an important source of dietary energy for lactating dairy cows and other ruminants, but few laboratory methods are available to determine starch digestion potential. A laboratory method, degree of starch gelatinization (DSG), commonly used by the food industry to assess relative differences in starch characteristics of human foods was modified for application to corn grain and corn silage. The modified assay, degree of starch access (DSA, g/kg starch), was used to evaluate starch recovery by enzymatic hydrolysis in gelatinized undried, unground corn grains and corn silages, which differed in particle size, dry matter content and endosperm type. Effects of particle size (370, 500, 640, 1100, 3140 and 4000 [mu]m) of corn grains, which are known to influence starch digestion in ruminants, were evaluated. For each 100 [mu]m increase in particle size, DSA decreased ($P < 0.001$) 26.8 g/kg starch. In high-moisture corn grain, for each 10 g/kg fresh matter increase in DM content, DSA decreased 20.0 g/kg starch ($r2 = 0.76$). In corn grain of differing endosperm vitreousness (0 g/100 g versus 100 g/100 g endosperm) DSA values were approximately 200 g/kg starch higher for corn grain with no vitreous endosperm as compared to corn grain with highly vitreous (100 g/100 g) endosperm. For corn silage, DSA was positively correlated to latent starch and starch retained on screens < 2.38 mm. While no comparisons between DSA and in vivo starch digestibility exist, the DSA assay may be useful as an index for evaluating differences in starch digestion potential of corn and corn silage fed to ruminants.
Keywords: Corn grain; Starch digestion; Vitreousness

Barbara Soetens, Caroline Braet, `The weight of a thought': Food-related thought suppression in obese and normal-weight youngsters, Appetite, Volume 46, Issue 3, May 2006, Pages 309-317, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.01.018.
(http://www.sciencedirect.com/science/article/B6WB2-4JVTC2G-1/2/ff6c4db6c08c041eb2404c9c1786dfd5)
Abstract: Objective

The ironic processing theory by Wegner states that suppressing unwanted thoughts can be counterproductive because it leads to a rebound of these thoughts, eventually causing increased preoccupations. In line with this view, the present study examines the effects of suppressing food- and eating- related thoughts in obese and non-obese youngsters.Method
Ninety-seven clinically obese and non-obese boys and girls, with different levels of dietary restraint, were asked to monitor their thoughts about food for 5 min, during three subsequent trial periods. Participants were instructed to suppress thoughts about food or to merely monitor them. The number of food-related thoughts was recorded across trials.Results
No indication was found for an overall post-suppression rebound effect. However, when examining subgroups of high and low restrained eaters, results showed that the obese high restrained eaters displayed a pattern that was indicative of a rebound effect for food-related thoughts. None of the other groups shared these effects.Discussion
The results corroborate the hypothesis that trying not to think about food and eating may be counterproductive, at least for a subgroup of clinically obese high restrained eaters. Thought suppression may be one of the factors contributing to acceleration and perpetuation of burdensome food-related thinking in clinically obese high restrained eaters.
Keywords: Thought suppression; Obese; Adolescents; Dietary restraint; Preoccupation; Food thoughts

Marieke Saher, Marjaana Lindeman, Ulla-Kaisa Koivisto Hursti, Attitudes towards genetically modified and organic foods, Appetite, Volume 46, Issue 3, May 2006, Pages 324-331, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.01.015.
(http://www.sciencedirect.com/science/article/B6WB2-4JHMXSG-4/2/b2579284b31e67b8dde8fdfacb031bc1)
Abstract:
Finnish students (N=3261) filled out a questionnaire on attitudes towards genetically modified and organic food, plus the rational-experiential inventory, the magical thinking about food and health scale, Schwartz's value survey and the behavioural inhibition scale. In addition, they reported their eating of meat. Structural equation modelling of these measures had greater explanatory power for attitudes towards genetically modified (GM) foods than for attitudes towards organic foods (OF). GM attitudes were best predicted by natural science education and magical food and health beliefs, which mediated the influence of thinking styles. Positive attitudes towards organic food, on the other hand, were more directly related to such individual differences as thinking styles and set of values. The results of the study indicate that OF attitudes are rooted in more fundamental personal attributes than GM attitudes, which are embedded in a more complex but also in a more modifiable network of characteristics.
Keywords: Genetically modified food; Organic food; Dual-processing; Intuitive thinking; Magical thinking

Dianne Beidler Walker, James Cornelius Walker, Peter James Cavnar, Jennifer Leigh Taylor, Duane Howard Pickel, Sandra Biddle Hall, Joseph Carlos Suarez, Naturalistic quantification of canine olfactory sensitivity, Applied Animal Behaviour Science, Volume 97, Issues 2-4, May 2006, Pages 241-254, ISSN 0168-1591, DOI: 10.1016/j.applanim.2005.07.009.
(http://www.sciencedirect.com/science/article/B6T48-4H21K1S-2/2/a479daf490a21744214d1873ea54511f)
Abstract:
Despite the large and growing dependence on dog-handler teams for solving 'real world' problems of odor detection, recognition and localization, no comprehensive methodology for quantifying the capabilities of such teams has been reported. We developed an approach in which each dog is housed with its owner-handler, deprived of neither food nor water and indicates to its handler which of five Teflon boxes contains the target odorant of n-amyl acetate (nAA). In two dogs

(Rottweiler, Standard Schnauzer) trained in this way, precisely controlled concentration ranges of nAA were systematically lowered over the course of several weeks, in blocks of three 9-trial sessions, until chance performance was seen. Data for each concentration were expressed in terms of a logistic regression equation relating concentration to the binomial probability that the observed performance (or better) would be seen by chance alone. That concentration corresponding to a probability of 0.05 was defined as threshold. In this admittedly small sample, the values we obtained (1.9 and 1.14 ppt) are roughly 30- to 20,000-fold lower than the range of thresholds reported by Krestel et al. [Krestel, D., Passe, D., Smith, J.C., Jonsson, L., 1984. Behavioral determination of olfactory thresholds to amyl acetate in dogs. Neurosci. Biobehav. Rev. 8, 169-174] in their conditioned suppression study of beagle sensitivity to nAA. Thus, it appears that there are significant advantages to our approach, though the reasons for differences in results are unclear. The 'find the target' aspect of this new method makes it readily applicable to odor processing tasks much more complex than detection of single compounds.
Keywords: Dog; Olfactory; n-Amyl; Acetate; Threshold; Naturalistic

S. Hoppe, S. Neidhart, K. Zunker, P. Hutasingh, R. Carle, H. Steinhart, A. Paschke, The influences of cultivar and thermal processing on the allergenic potency of lychees (Litchi chinensis SONN.), Food Chemistry, Volume 96, Issue 2, May 2006, Pages 209-219, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.02.020.
(http://www.sciencedirect.com/science/article/B6T6R-4FTXXKC-2/2/825643e058aac559f9fe9b5b8e0379a5)
Abstract:
This study was aimed at the cultivar-specific allergenic potency of lychees (Litchi chinensis SONN.) and its modification by typical industrial processing, investigating the fresh aril of seven different lychee lots which represented five cultivars. Technological focus was on thermal treatments during fruit preservation by canning. Canned lychee halves in syrup were produced by canning at 90 and 121 [degree sign]C for various times to analyse the final products immediately after processing and after eight-months storage. SDS-PAGE and non-specific silver staining were performed to characterise the protein pattern. The allergenic potency of the proteins was demonstrated by immunoblotting with sera of probands suffering from lychee allergy. Furthermore, the allergenic potency was determined by inhibitive enzyme allergosorbent tests (EAST-inhibition). Any significant dependence between cultivar and the allergenic potency of the fresh fruit could not be established. According to their heat sensitivity during canning, lychee allergens with different behaviour could be distinguished. After excessive canning, inducing severe loss of sensory quality, the allergenic potency of the fruit decreased, even though high residual allergenic activity was observed.
Keywords: Litchi chinensis SONN.; Food allergy; Cultivar; Canning; Sensory quality

F. Naim, D. Leblanc, S. Messier, L. Saucier, G. Piette, A. Houde, Shiga toxin production by sausage-borne Escherichia coli O157:H7 in response to a post-processing in vitro digestion challenge, Food Microbiology, Volume 23, Issue 3, May 2006, Pages 231-240, ISSN 0740-0020, DOI: 10.1016/j.fm.2005.04.006.
(http://www.sciencedirect.com/science/article/B6WFP-4GSBGRD-1/2/02234bb81fe316274c7d4b710cad776c)
Abstract:
In order to study the effects of the fermentation-drying procedure and subsequent in vitro digestion on Shiga toxins (Stx) production by Escherichia coli O157:H7, dry sausages were inoculated during the formulation step with pure cultures of strains 5-1 and ATCC 43895. The inoculated sausages were submitted to a minimum (30 min, pH between 3.1 and 3.5) or a maximum (120 min at stepwise adjusting the pH downward) gastric challenge followed by a 240-min pancreatic challenge at pH 8.0 and 37 [degree sign]C. Production of toxins by the overnight culture controls,

assessed using the Vero cell assay, was dependent on the pathogen cell concentration. The effect of cell concentration was not relevant in sausage samples and data showed: (a) higher Stx production in contaminated sausage samples than in overnight cultures; (b) the lowest Stx levels were detected with undigested sausage samples; (c) the maximum gastric challenge enhanced Stx production, compared to minimally digested and undigested samples. Reverse transcriptase polymerase chain reaction (RT-PCR) performed on extracts from inoculated, digested (4.5-6 h process) and undigested sausages produced amplicons for both stx1 and stx2 mRNA, suggesting that post-stress expression of stx genes had occurred. Our data suggest that sub-lethal stresses imposed by the fermentation-drying procedure and subsequent digestion of ingested food (i.e. contaminated sausages) may affect the degree to which the surviving E. coli O157:H7 cells express their virulence in vivo.
Keywords: Escherichia coli O157:H7; In vitro digestion challenge; Shiga toxins production; Fermentation-drying process; Cytotoxic response

P. Jelen, R.Y. Yada (Ed.), Proteins in Food Processing, Woodhead Publishing Ltd, Cambridge, UK, ISBN:1-85573-723-X/CRC Press, Boca Raton, FL, ISBN:0-8493-2536-6, 2004 (xviii+686pp., $299.95)., International Dairy Journal, Volume 16, Issue 5, May 2006, Pages 497-498, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2005.11.002.
(http://www.sciencedirect.com/science/article/B6T7C-4HWXKXT-3/2/bdf87fc98b21d6a22dd2862c33817732)

Maria-Sonia G. Garcia, Eva Balsa-Canto, Antonio A. Alonso, Julio R. Banga, Computing optimal operating policies for the food industry, Journal of Food Engineering, Volume 74, Issue 1, May 2006, Pages 13-23, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.02.011.
(http://www.sciencedirect.com/science/article/B6T8J-4FWV28C-1/2/4e69293dc36a58dbcdcf16146a1a9804)
Abstract:
Food processing plants are usually operated in batch or semi-continuous mode. Dynamic optimization techniques can be used to compute optimal operating policies in order to ensure maximum profits and product quality while guaranteeing food safety. However, the nonlinear and highly constrained nature of food processing models can make their dynamic optimization a daunting task. Here, we analyze the performance of several state of the art methods considering two selected case studies: a semi-continuous fermentor and a thermal sterilization unit. We also propose novel sequential re-optimization strategies in order to avoid convergence problems and to improve computational efficiency.
Keywords: Dynamic optimization; Optimal control; Food processing; Optimal operating policies

Susana Rodriguez Couto, Elena Lopez, M. Angeles Sanroman, Utilisation of grape seeds for laccase production in solid-state fermentors, Journal of Food Engineering, Volume 74, Issue 2, May 2006, Pages 263-267, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.03.004.
(http://www.sciencedirect.com/science/article/B6T8J-4G0M3FW-1/2/7c7b6d276c4167f60086e0c59dcfe42e)
Abstract:
The aim of the present paper was to investigate the feasibility of grape seeds as a support-substrate for laccase production by the white-rot fungus Trametes hirsuta under solid-state conditions, operating in laboratory-scale bioreactors. Two bioreactor configurations were considered in order to determine the most suitable one: immersion and tray. As regards bioreactor design, the tray configuration led to the highest laccase activities. In addition, the nature of the support employed (inert or non-inert) on laccase production was also evaluated. The results obtained clearly showed the superiority of grape seeds for laccase production over nylon sponge, since they produced much higher activities (around threefold).

On the other hand, decolourization of structurally different dyes by the extracellular liquid obtained in the tray configuration operating with grape seeds as a support was assayed. The results showed that the individual dye structures influenced the decolourization extent. However, in all cases a decolourization kinetic of first order with respect to dye concentration was found.
Keywords: Bioreactors; Food processing industry; Grape seeds; Laccase; Solid-state fermentation

John F. Kennedy, Parmjit S. Panesar, H. Ramaswamy, M. Marcotte (Eds.), Food Processing: Principles and Applications, CRC Press, Taylor and Francis Group, Boca Raton, FL, USA, 2006 (xvi+420 pp., [pound sign]39.99, ISBN 1-58716-008-0)., Carbohydrate Polymers, Volume 64, Issue 1, 19 April 2006, Page 138, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2005.10.002.
(http://www.sciencedirect.com/science/article/B6TFD-4J5T5XX-5/2/00bf7c3d8cc9bfaedceb9a7d3d37b57f)

Paul E. Orndorff, Terri S. Hamrick, Ida Washington Smoak, Edward A. Havell, Host and bacterial factors in listeriosis pathogenesis, Veterinary Microbiology, Volume 114, Issues 1-2, 16 April 2006, Pages 1-15, ISSN 0378-1135, DOI: 10.1016/j.vetmic.2005.12.003.
(http://www.sciencedirect.com/science/article/B6TD6-4J2M4DY-2/2/bba8ccf37c95d861e6569d1cd8fb1df6)
Abstract:
Members of the Genus Listeria are ubiquitous environmental saprophytic microorganisms. If ingested they can cause a severe disseminated disease (listeriosis) that has a high mortality rate, the highest of any food-borne pathogen, even with antibiotic therapy. Central to the high mortality rate is the hallmark characteristic of the microorganism to grow intracellularly. The presence of listeriae in food processing plants has resulted in many outbreaks of human disease and large scale recalls of processed foods. Despite the ubiquity of the microorganism, the actual disease rate (those animals showing disease signs over those exposed) is quite low and disease is almost always associated with an underlying predisposition (pregnancy being the most common in otherwise normal individuals). There are many features of the pathogenesis of listeriosis that have remained mysterious despite the extensive use of the microorganism in the study of cell-mediated immunity and intracellular growth. Informational advances such as the sequence of the mouse and listerial genomes, and technical advances such as the discovery of listeria-susceptible mouse strains, may renew interest in the study of the natural pathogenesis of the disease. This may be further facilitated by studies that employ the natural inoculation route and mimic common predisposing conditions witnessed in victims of natural outbreaks.
Keywords: Listeria; Pathogenesis; Pregnancy; Predisposition; Veterinary

Miia Lindstrom, Katri Kiviniemi, Hannu Korkeala, Hazard and control of group II (non-proteolytic) Clostridium botulinum in modern food processing, International Journal of Food Microbiology, Volume 108, Issue 1, 15 April 2006, Pages 92-104, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.11.003.
(http://www.sciencedirect.com/science/article/B6T7K-4J7B0RJ-1/2/db6b453355d17aeef4a929cf5844d4ce)
Abstract:
Group II (non-proteolytic) Clostridium botulinum poses a safety hazard in modern food processing, which consists of mild pasteurization treatments, anaerobic packaging, extended shelf lives and chilled storage. The high risk is reflected in the relatively large number of botulism cases due to group II C. botulinum in commercially produced foods during the past decades. Because of the high prevalence of group II C. botulinum in the environment, food raw materials may carry spores. Although group II spores are less heat-resistant than group I (proteolytic) spores, they can tolerate the heat treatments employed in the chilled food industry. Some food components may actually provide spores with protection from heat. Spore heat resistance should therefore be investigated

for each food in order to determine the efficiency of industrial heat treatments. Group II strains are psychrotrophic and thus they are able to grow at refrigeration temperatures. Anaerobic packages and extended shelf lives provide C. botulinum with favourable conditions for growth and toxin formation. As the use of salt and other preservatives in these foods is limited, microbiological safety relies mainly on refrigerated storage. This sets great challenges on the production of chilled packaged foods. To ensure the safety of these foods, more than one factor should safeguard against botulinal growth and toxin production.
Keywords: Clostridium botulinum; Botulism; Botulinum neurotoxin; Spore heat resistance; Food safety

Jean Alamed, D. Julian McClements, Eric A. Decker, Influence of heat processing and calcium ions on the ability of EDTA to inhibit lipid oxidation in oil-in-water emulsions containing omega-3 fatty acids, Food Chemistry, Volume 95, Issue 4, April 2006, Pages 585-590, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.01.041.
(http://www.sciencedirect.com/science/article/B6T6R-4FSCMGB-7/2/ecf7bd50b0cb907c552c6c50da402032)
Abstract:
The nutritional benefits of [omega]-3 fatty acids make them excellent candidates as functional food ingredients if problems with oxidative rancidity can be overcome. Oil-in-water emulsions were prepared with 2% salmon oil, stabilized by 0.2% Brij 35 at pH 7. To determine the effects of heating (50-90 [degree sign]C), ethylenediaminetetraacetic acid (EDTA), and calcium on the oxidative and physical stability of salmon oil-in-water emulsions, particle size, thiobarbituric acid reactive substances (TBARS), and lipid hydroperoxides were measured. The heat-processed emulsions showed no significant difference, in particle size, TBARS or hydroperoxides during storage, from unheated emulsions. Above 2.5 [mu]M, EDTA dramatically decreased lipid oxidation in all samples. Addition of calcium to emulsions containing 7.5 [mu]M EDTA significantly increased both TBARS and hydroperoxide formation when calcium concentrations were 2-fold greater than EDTA concentrations. These results indicate that heat-processed salmon oil-in-water emulsions with high physical and oxidative stability could be produced in the presence of EDTA.
Keywords: [omega]-3 fatty acids; Emulsion; Lipid oxidation; Antioxidants; EDTA

Vipin Kumar, Dhananjay Kumar Tewary, Srigiripuram Desikachar Ravindranath, Adarsh Shanker, Investigation in tea on fate of fenazaquin residue and its transfer in brew, Food and Chemical Toxicology, Volume 44, Issue 4, April 2006, Pages 596-600, ISSN 0278-6915, DOI: 10.1016/j.fct.2005.10.010.
(http://www.sciencedirect.com/science/article/B6T6P-4J91NKN-2/2/c318f7d035fb07e408b8ab8f591cdb6f)
Abstract:
Fenazaquin is a non-systemic acaricide/insecticide used widely in controlling mites and other related pests in fruits, vegetables and tea. The objective of this research was to investigate the disappearance trend in tea of fenazaquin residue level and its transfer in brew. Fenazaquin was applied on a tea crop at two rates, 125 and 250 g AI/ha in wet and dry seasons under field conditions. Samples (green shoots, made tea and its brew) were analyzed for fenazaquin and quantification was by high performance liquid chromatography using a UV detector. The residue dissipated faster in the wet season than in the dry season. Seven days after the treatment (normal round of plucking) the residues observed in the green shoots at the two rates were 2.17, 3.07 mg/kg and 2.04, 2.84 mg/kg in the wet and dry seasons, respectively. However, the degradation rale in both seasons followed first-order kinetics. Half-lives in green shoots were in range 1.43-1.70 and 2.10-2.21 days and in made tea 1.59-1.73 and 1.87-1.94 days for wet and dry seasons, respectively. During processing of green shoots to made tea considerable loss (42-70%) of residue was observed. The transfer of residue from made tea brew was in the range 3-22%. In

brew residue were below 0.02 mg/l after 5 days of application at both the rates in either of the seasons. The estimated intake with brew (normal consumption of 10 cup/day/adult) thus would be below the acceptable daily intake for fenazaquin (0.005 mg/kg-body weight). To avoid health hazards due to the toxic effect of residues in brew, a waiting period for plucking the tea shoots after fenazaquin application of more than 5 days for both the seasons at recommended rate (125 g AI/ha) may be suggested and considered quite safe.
Keywords: Fenazaquin; Residue; Tea; Brew; Transfer

R. Simpson, C. Cortes, A. Teixeira, Energy consumption in batch thermal processing: model development and validation, Journal of Food Engineering, Volume 73, Issue 3, April 2006, Pages 217-224, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.01.040.
(http://www.sciencedirect.com/science/article/B6T8J-4FY3NWD-1/2/97449c1cf7508f717d3328cc25d24c9d)
Abstract:
Thermal processing is an important method of food preservation in the manufacture of canned foods, retortable pouches, trays and bowls (retortable shelf-stable foods).
The aim of this research was to develop a mathematical model to estimate total and transient energy consumption during the heat processing of retortable shelf-stable foods.
The transient energy balance for a system defined as the steam and its water condensate in the retort requires no work term. The heat transfer terms include radiation and convection to the cook room environment, and heat transfer to the food in the cans. Mass and energy balance equations for the system were solved simultaneously, and the equation describing heat transfer in the food material was solved numerically using an explicit finite difference technique. Correlations valid in the range of interest (100 [degree sign]C through 140 [degree sign]C) were utilized to estimate the thermodynamic properties of steam, condensate, and food product.
Depending upon selected conditions, retort insulation will account for a 15-25% energy reduction. In addition, initial temperature could reduce the peak energy demand in the order of 25-35%.
These models should be useful in searching for optimum scheduling of retort battery operation in the canning plant, as well as in the optimising process conditions, to minimize energy consumption.
Keywords: Energy consumption; Batch processing; Retort insulation

R.C. Martins, Simple finite volumes and finite elements procedures for food quality and safety simulations, Journal of Food Engineering, Volume 73, Issue 4, April 2006, Pages 327-338, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.01.033.
(http://www.sciencedirect.com/science/article/B6T8J-4FSCV2D-1/2/3c7d5318dbb9fb5c7ff274b59d5efddb)
Abstract:
This research paper presents simple, but extremely useful, finite volumes method (FVM) and finite elements method (FEM) procedures that can be applied to calculate food quality and safety losses during processing, storage and distribution. FVM and FEM schemes are presented for the following reaction kinetic models: (i) zero-order reaction kinetics; (ii) first-order reaction kinetics; (iii) fractional conversion model; (iv) the Bigelow model of thermal inactivation (D - z) and (v) non-linear microbiological death model with lag and shoulder phases.
Reaction rates, specimens concentrations, quality loss factors and microbiological population were assumed to vary consistently with the element shape function inside the finite element. Furthermore, no mass transfer was assumed between element nodes, and only reaction models were derived. These can thereafter be used in conjuction with other FVM and FEM schemes during `multi-physics' simulations.
Statistical functions are presented for both FVM and FEM to make easier the evaluation of food quality and safety. The average and standard deviation is evaluated inside all physical domain, but

is also derived for the foods surface. Finally, considerations on the presented FVM and FEM procedures are discussed.
Keywords: Finite volumes method; Finite elements method; Quality loss kinetics; Microbiological death

Piotr P. Lewicki, Design of hot air drying for better foods, Trends in Food Science & Technology, Volume 17, Issue 4, EFFoST Warsaw 2004, April 2006, Pages 153-163, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.10.012.
(http://www.sciencedirect.com/science/article/B6VHY-4HPD3MY-1/2/3a0f420f53bd145e77e260e980a5b6a6)
Abstract:
Drying of food consists of three steps, namely pre-drying processing, dehydration and post-drying handling of the material. The pre-drying processes depend on the physical state of the material subjected to drying. Liquids are vacuum concentrated, treated with enzymes or foamed, while solids are sulfited, soaked in solutions of different compounds, dewatered by osmosis, blanched, frozen or treated by high pressure. Drying of the pre-treated material can be done under vacuum or at atmospheric pressure. Material undergoing drying can be heated by surface heating or by volumetric heating, and it can be stationary or set in motion. Storage stability of a dry material depends on the state at which the drying process is finished. The effect of all these steps on quality of the final product are discussed. It is shown that to design a process of hot air drying a thorough understanding of all the operations affecting quality is needed.

A. Gowen, N. Abu-Ghannam, J. Frias, J. Oliveira, Optimisation of dehydration and rehydration properties of cooked chickpeas (Cicer arietinum L.) undergoing microwave-hot air combination drying, Trends in Food Science & Technology, Volume 17, Issue 4, EFFoST Warsaw 2004, April 2006, Pages 177-183, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.11.013.
(http://www.sciencedirect.com/science/article/B6VHY-4J4HK8M-1/2/3ed618d5db24278c7544b89c54c5836c)
Abstract:
Combined microwave-hot air drying is an innovative technique that could dramatically reduce processing times for many foods. In this study, combination drying of whole, pre-cooked chickpeas was investigated for three microwave power (210, 300, 560 W) and three air temperature (23, 160, 250 [degree sign]C) settings. Asymptotic models were proposed to describe both moisture ratio and weight gain on rehydration as functions of time, microwave power (MW) and air temperature (T). Combination drying with MW=210 W and T=160 [degree sign]C was optimal in terms of drying time, rehydration time, texture and colour.

Y. Sudaryanto, S.B. Hartono, W. Irawaty, H. Hindarso, S. Ismadji, High surface area activated carbon prepared from cassava peel by chemical activation, Bioresource Technology, Volume 97, Issue 5, March 2006, Pages 734-739, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.04.029.
(http://www.sciencedirect.com/science/article/B6V24-4GDBT7V-2/2/96e2e2eb623e12da635cad885b932770)
Abstract:
Cassava is one of the most important commodities in Indonesia, an agricultural country. Cassava is one of the primary foods in our country and usually used for traditional food, cake, etc. Cassava peel is an agricultural waste from the food and starch processing industries. In this study, this solid waste was used as the precursor for activated carbon preparation. The preparation process consisted of potassium hydroxide impregnation at different impregnation ratio followed by carbonization at 450-750 [degree sign]C for 1-3 h. The results revealed that activation time gives no significant effect on the pore structure of activated carbon produced, however, the pore characteristic of carbon changes significantly with impregnation ratio and carbonization

temperature. The maximum surface area and pore volume were obtained at impregnation ratio 5:2 and carbonization temperature 750 [degree sign]C.
Keywords: Activated carbon; Pore structure; Cassava peel; Activation

H.J. Kang, S.P. Chawla, C. Jo, J.H. Kwon, M.W. Byun, Studies on the development of functional powder from citrus peel, Bioresource Technology, Volume 97, Issue 4, March 2006, Pages 614-620, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.03.037.
(http://www.sciencedirect.com/science/article/B6V24-4H2FXVW-1/2/dc75bdc4752173d7f0beb09a7b5edc1c)
Abstract:
The suitability of citrus peels, generated as a by-product of the juice industry, as a source of antioxidants was investigated. Citrus peel powder was prepared by lyophilizing 70% ethanol extract from citrus peels. Extraction was carried out at room temperature (20 [degree sign]C) for 72 h. The extract was subjected to gamma-irradiation treatment (20 kGy). The aqueous solutions of citrus peel powder were examined for color characteristics and antioxidant potential in terms of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging, [beta]-carotene bleaching and nitrite scavenging activities. There were significant changes in Hunter color values due to irradiation. The a*- and b*-values decreased due to radiation treatment. DPPH radical scavenging, [beta]-carotene bleaching and nitrite scavenging activities were not affected by irradiation treatment. Nitrite scavenging activity was the highest in the extract at pH 1.2 followed by pH 4.2 and 6.0. These functional properties of the aqueous solution were found to be stable in heat treatment. It could significantly improve oxidative stability of lipids in fish meat system. Based on these results there may be opportunities to use citrus peel powder as a functional component in the food processing industry with gamma irradiation treatment improving its color characteristics without adversely influencing the functional properties.
Keywords: Irradiation; Citrus peel extract; Lyophilized powder; Bioactivity

Tammi L. Richardson, George A. Jackson, Hugh W. Ducklow, Michael R. Roman, Spatial and seasonal patterns of carbon cycling through planktonic food webs of the Arabian Sea determined by inverse analysis, Deep Sea Research Part II: Topical Studies in Oceanography, Volume 53, Issues 5-7, The US JGOFS Synthesis and Modeling Project: Phase III, March-April 2006, Pages 555-575, ISSN 0967-0645, DOI: 10.1016/j.dsr2.2006.01.015.
(http://www.sciencedirect.com/science/article/B6VGC-4K1G54V-2/2/b047beeb4d1419d01865c3f68c6da8e5)
Abstract:
We used inverse and network analyses to describe food web dynamics during three seasons (Northeast Monsoon, Spring Intermonsoon and Southwest Monsoon) at three contrasting stations in the Arabian Sea. The goal of this work was to characterize carbon flows and trophic transfers in this highly variable system. The inverse approach allowed us to trace the fate of fixed carbon through a representative food web and to characterize temporal and spatial variability in the role of various food web components in the processing of carbon within, and export of carbon from, the euphotic zone. Zooplankton grazing did not equal net phytoplankton production for most of the stations and seasons examined. The proportion of primary production consumed by the protozoa and microzooplankton was nearly always highest at the coastal station and lowest at the offshore stations. Where large phytoplankton dominated primary production, they were also the primary source of carbon for mesozooplankton. Otherwise, the mesozooplankton were omnivorous, consuming primarily detritus and protozoa. Through direct and indirect routes, picophytoplankton dominated export fluxes at all stations and in most seasons, particularly through the particulate and dissolved carbon export pathways. This is in contrast to their conventional importance in recycling. More frequent measurements of C:Chl ratios, increased availability of depth-dependent

rate measurements, and the availability of size-fractionated primary production rates would improve our ability to describe food web processes.
Keywords: Carbon; Food web; Inverse; Arabian Sea; Monsoon; Export

Inga Nordhaus, Matthias Wolff, Karen Diele, Litter processing and population food intake of the mangrove crab Ucides cordatus in a high intertidal forest in northern Brazil, Estuarine, Coastal and Shelf Science, Volume 67, Issues 1-2, March 2006, Pages 239-250, ISSN 0272-7714, DOI: 10.1016/j.ecss.2005.11.022.
(http://www.sciencedirect.com/science/article/B6WDV-4J2TVVH-5/2/40d72a8a7b2d1eb6321699399da3bc40)
Abstract:
This study provides the first quantification of the population food intake of the litter-consuming mangrove crab Ucides cordatus (Ocypodidae, L. 1763) in a New World mangrove forest. Diet, feeding periodicity, gastric evacuation rates and size-dependent consumption were determined for this intensively exploited semi-terrestrial crab in different types of mangrove forest.
Unlike many other crabs Ucides cordatus is a continuous feeder, as shown by gastrointestinal contents over a day's cycle. Starvation experiments revealed that most gastric evacuation occurs during the first 12 h after feeding, following an exponential decay function. Evacuation rates (0.35 h-1 and 0.31 h-1) for small (carapace width CW 2.5-3.5 cm) and large (CW 6.5-7.5 cm) crabs, respectively, and the mean daily gastrointestinal contents were used to calculate the daily food intake (DFI) of U. cordatus for both sexes and different size classes. DFI was strongly correlated to body size and ranged from 19.8 to 6.0% of body dry weight in small and large crabs, respectively. The daily energy intake of U. cordatus (37.6 kJ for a 65 g wet weight specimen) was high when compared to other leaf-eating crabs.
Litter fall and propagule production were calculated as 16.38 t ha-1 y-1, corresponding to a daily mean of 4.49 g m-2 in a high intertidal Rhizophora mangle forest stand. The estimated population food intake of Ucides cordatus (4.1 g dw m-2 d-1) corresponds to 81.3% of this production. This high litter removal rate, a low litter quantity in burrows and high consumption rates during field experiments suggest that the local crab population is food-limited in many parts of the study area. The very efficient coupling of forest litter production and crab litter consumption is possible due to the high crab density and the low inundation frequency of the mangrove forests, allowing for prolonged foraging periods. By processing the major part of the litter, U. cordatus helps to retain nutrients and energy within the mangrove ecosystem. The impact of this species on litter turnover in a New World mangrove is similar to or even higher than that of litter-feeding sesarmid crabs in the Indo-West Pacific region.
Keywords: Ucides cordatus; mangrove crab; food consumption; gastric evacuation; feeding periodicity; litter production; North Brazil

Hechun Zhang, Jixun Zhan, Keman Su, Yuanxing Zhang, A kind of potential food additive produced by Streptomyces coelicolor: Characteristics of blue pigment and identification of a novel compound, [lambda]-actinorhodin, Food Chemistry, Volume 95, Issue 2, March 2006, Pages 186-192, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.12.028.
(http://www.sciencedirect.com/science/article/B6T6R-4FH0DBK-F/2/1235679c616b73c64e56839bc9345aaa)
Abstract:
The blue pigment produced by Streptomyces coelicolor 100 with a yield as high as 3 g/l is a mixture of 10 components. The structure of one of the components was identified and it is a new actinorhodin analogue, named as [lambda]-actinorhodin. The natural pigment can be dissolved in alkaline water solution and a number of organic solvents in common use. The color of a water solution of the pigment changes with pH value. The pigment is stable to light, heat and food additives in common use, and resistant to oxidants and reducers under acidic conditions and to

reducers under alkaline conditions. Most inspected metal ions hardly affected pigment stability except for Fe2+ at high concentration and Pb2+. The pigment is nontoxic with LD50 > 15,000 mg/kg in an acute toxicity trial. The good characteristics of the pigment make it potential useful in the food processing industry as an additive.
Keywords: Actinorhodin; [lambda]-actinorhodin; Food additive; Pigment; Blue pigment; Streptomyces coelicolor

E. Allen Foegeding, P.J. Luck, J.P. Davis, Factors determining the physical properties of protein foams, Food Hydrocolloids, Volume 20, Issues 2-3, 7th International Hydrocolloids Conference, March-May 2006, Pages 284-292, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2005.03.014.
(http://www.sciencedirect.com/science/article/B6VP9-4GXVGFF-3/2/abc4fa2ce0a1abec986a225a3059b98e)
Abstract:
Protein foams are an integral component of many foods such as meringue, nougat and angel food cake. With all these applications, the protein foam must first obtain the desired level of air phase volume (foamability), and then maintain stability when subjected to a variety of processes including mixing, cutting and heating. Therefore, factors determining foamability and stability to mechanical and thermal processing are important to proper food applications of protein foams. We have investigated the effects of protein type, protein modification and co-solutes on overrun, stability and yield stress. The level of overrun generated by different proteins was: whey protein isolate hydrolysates >whey protein isolate=[beta]-lactoglobulin=egg white>[alpha]-lactalbumin. The level of yield stress generated by different proteins was: egg white>whey protein isolate hydrolysates>=[beta]-lactoglobulin>whey protein isolate>[alpha]-lactalbumin. Factors that decreased surface charge (pH~pI or high ionic strength) caused a more rapid adsorption of protein at the air-water interface, generally increased dilatational viscoelasticity and increased foam yield stress. The elastic component of the dilatational modulus of the air-water interface was correlated with foam yield stress. The properties of foams did not predict performance in making angel food cakes. A model for foam performance in angel food cakes is proposed.
Keywords: Foams; Proteins; Air-water interface; Surface tension

Dong Ou, Gauri S. Mittal, Double-sided pan-frying of unfrozen/frozen hamburgers for microbial safety using modelling and simulation, Food Research International, Volume 39, Issue 2, March 2006, Pages 133-144, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.06.009.
(http://www.sciencedirect.com/science/article/B6T6V-4GWJ8B6-3/2/02f3dd9ba6bf73b12decd7e4f0b75331)
Abstract:
The predictive mathematical heat and mass (water and fat) transfer models for the double-sided pan-frying of unfrozen and frozen hamburger patties were developed and validated against experimental data. The simulation results demonstrated the inactivation of Escherichia coli O157:H7, Listeria innocua, and Salmonella serotypes within patties during cooking. The effects of various patty thickness and pan temperature on safe process time were analyzed. For a safe patty, double-sided pan-frying with 160 [degree sign]C pan temperature is recommended due to its faster cooking and better microbial safety. The cooking times for double-sided pan-frying of frozen and unfrozen patties are approximately 293 and 115 s, respectively. The increase in heating temperature resulted in higher rates of patty centre temperature increase and water and fat losses, and decreased the process time for 12 log reductions of microorganisms. An increase in the thickness of the patty resulted in an increased process time.
Keywords: Hamburger; Pan-frying; Cooking; Food safety; Meat processing; Process modelling; Simulation

Mabel Salas Hernandez, Marilu Rodriguez Rodriguez, Nelson Perez Guerra, Renato Perez Roses, Amylase production by Aspergillus niger in submerged cultivation on two wastes from food industries, Journal of Food Engineering, Volume 73, Issue 1, March 2006, Pages 93-100, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.01.009.
(http://www.sciencedirect.com/science/article/B6T8J-4FMK89H-1/2/6df4b60795297494806ebbd608f3b05b)
Abstract:
Synthesis of amylase and protease by Aspergillus niger strain UO-1 was followed in media prepared with brewery (BW) and meat (MPW) wastewaters supplemented with different starch concentrations. The highest amylase (70.29 and 60.12 EU/mL) and protease (6.11 and 6.03 EU/mL) production were, respectively, obtained in the BW and MPW media supplemented with 40 g of starch/L of medium after 88 h of fermentation. In addition, the initial chemical oxygen demand (COD) in both wastes was reduced by more than 92%.
High amylase and protease activities were found in the BW medium supplemented with casaminoacids, peptone or yeast extract, but ammonium nitrate and sodium nitrate were also good nitrogen sources for amylase production. The stabilities of amylase and protease were higher at 50 [degree sign]C and pH 4.95 and at 53.4 [degree sign]C and pH 3.87, respectively, but they were highly sensitive at temperatures of 70 [degree sign]C or higher.
Keywords: Aspergillus; Amylase; Protease; Meat processing wastes; Brewery wastes; Chemical oxygen demand (COD)

S. Panigrahi, S. Balasubramanian, H. Gu, C. Logue, M. Marchello, Neural-network-integrated electronic nose system for identification of spoiled beef, LWT - Food Science and Technology, Volume 39, Issue 2, March 2006, Pages 135-145, ISSN 0023-6438, DOI: 10.1016/j.lwt.2005.01.002.
(http://www.sciencedirect.com/science/article/B6WMV-4FRTDG6-1/2/4ebf75d7c52af3feeb9694e4d7d88a47)
Abstract:
A commercially available Cyranose-320(TM) conducting polymer-based electronic nose system was used to analyse the headspace from fresh beef strip loins (M. Longissimus lumborum) stored at 4[degree sign] and 10 [degree sign]C. The raw signals obtained from the electronic nose system were pre-processed by various signal-processing techniques to extract area-based features. Principal component analysis was subsequently performed on the processed signals to further reduce the dimensionalities. Classification models using radial basis function neural networks were developed using the extracted features. The performance of the developed models was validated using leave-1-out cross-validation method. The developed models classified meat samples stored at two storage temperatures into two groups, i.e., 'unspoiled' (microbial counts<6.0 log10 cfu/g) and 'spoiled' (microbial counts [greater-or-equal, slanted]6.0 log10 cfu/g). Maximum total classification accuracies of 100% were obtained for both the samples stored at 10 and 4 [degree sign]C. Classification models based on 'Area scaled' feature showed higher accuracies than that obtained using 'Area unscaled feature.'
Keywords: Electronic nose; Intelligent sensors; Artificial neural networks; Meat spoilage; Classification; Food quality

V. Julliand, A. De Fombelle, M. Varloud, Starch digestion in horses: The impact of feed processing, Livestock Science, Volume 100, Issue 1, Nutritive Value of Concentrates in Horses, March 2006, Pages 44-52, ISSN 1871-1413, DOI: 10.1016/j.livprodsci.2005.11.001.
(http://www.sciencedirect.com/science/article/B7XNX-4JGXNYB-9/2/4b184ecfae842f18a588ff6350062bf3)
Abstract:

Neither the partition of digestion between the foregut and the hindgut nor the factors of variation for diverse starches in feeds or rations is well documented in spite of their importance in respect of nutrition and health of the athletic horse. At similar intakes, feed processing and the botanical origin of the starch are two major factors that control the extent of prececal starch digestion. Physical and biochemical changes occurring during the process influence both the mean retention time of the feeds and the enzymatic activity in the foregut. Apparent digestibility of cereal starch varies from 20% to 90% in the foregut depending on the process used. Physical processes have a lesser effect than thermal and hydrothermal ones. Physical processes increase significantly the prececal digestibility of cornstarch but have a moderate impact on other cereals. Starch digestibility is increased by thermal and hydrothermal processes whatever the botanical origin. Feed processing was shown to affect the fermentability of starch in ruminants. In horses, a similar impact is expected not only in the hindgut but also in the stomach where numerous starch-utilizing bacteria have been observed. Further investigations are needed to identify the process which allows the highest prececal digestibility and decreases the hindgut fermentability of starch.
Keywords: Starch digestion; Horses; Food processing

J.A. Castro-Hermida, I. Pors, F. Mendez-Hermida, E. Ares-Mazas, C. Chartier, Evaluation of two commercial disinfectants on the viability and infectivity of Cryptosporidium parvum oocysts, The Veterinary Journal, Volume 171, Issue 2, March 2006, Pages 340-345, ISSN 1090-0233, DOI: 10.1016/j.tvjl.2004.11.003.
(http://www.sciencedirect.com/science/article/B6WXN-4F9245W-1/2/e7fbf908a703c8a44647eaf998399494)
Abstract:
Cryptosporidiosis is mainly a problem in neonatal ruminants. Not only do Cryptosporidium spp. spread ubiquitously in our environment, but the protozoa are highly resistant to harsh environmental conditions and disinfectants, and a control measure is urgently required. This study investigated the potential biocidal activity on Cryptosporidium parvum oocysts of two commercial disinfectants developed originally to be used in farms and food-processing industries. The products, containing formaldehyde and hydrogen peroxide respectively, both had some anticryptosporidial effects. The viability and infectivity of purified C. parvum oocysts exposed to both disinfectants at different concentrations and exposure times were evaluated by inclusion or exclusion of vital dye (propidium iodide), use of an excystation technique and infection of suckling mice. Viability assays showed a decrease in oocyst viability associated with an increase in exposure time for each of the concentrations used. The intensity of infection in neonatal mice was significantly lower ($P < 0.05$) than in the control litters.
Keywords: Cryptosporidium parvum; Formaldehyde; Hydrogen peroxide; In vitro viability; In vivo infectivity

William G.T Willats, J. Paul Knox, Jorn Dalgaard Mikkelsen, Pectin: new insights into an old polymer are starting to gel, Trends in Food Science & Technology, Volume 17, Issue 3, March 2006, Pages 97-104, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.10.008.
(http://www.sciencedirect.com/science/article/B6VHY-4HK04H9-1/2/6cc62c09ef1a9223ec67b57d0f236e4f)
Abstract:
Pectin is a high value functional food ingredient widely used as a gelling agent and stabilizer. It is also an abundant, ubiquitous and multifunctional component of the cell walls of all land plants. Food scientists and plant scientists therefore share a common goal to better understand the structure and functionalities of pectic polymers at the molecular level. The basic properties of pectin have been known for nearly 200 years, but recently there has been tremendous progress in our understanding of the very complex fine structure of pectic polymers and pectinolytic enzymes. This has been made possible by synergies between plant and food research and by the

application of a range of state-of-the-art techniques including enzymatic fingerprinting, mass spectrometry, NMR, molecular modelling, and monoclonal antibodies. With this increased knowledge comes the prospect of novel applications. Producers are beginning to develop a new generation of sophisticated designer pectins with specific functionalities. Moreover, the ability to manipulate pectin in planta would have a major impact on fruit and vegetable quality and processing, as well as on pectin production.
Keywords: Pectin; Pectinomics; Pectin analysis

Mohammad Shafiur Rahman, State diagram of foods: Its potential use in food processing and product stability, Trends in Food Science & Technology, Volume 17, Issue 3, March 2006, Pages 129-141, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.09.009.
(http://www.sciencedirect.com/science/article/B6VHY-4HNSB1M-2/2/1e72d031ffa2bec30195b35deeb33a08)
Abstract:
State diagram is a map of the different states of a food as a function of water or solids content and temperature. The main advantage of drawing map is in identifying different states of a food, such as freezing point and glass transition, which helps in understanding the complex changes when food's water content and temperature are changed. It also assists in identifying food's stability during storage as well as selecting suitable conditions of temperature and moisture content for processing. This paper provides an overview and critical assessment on the basic concepts of the state diagram with their terminologies, selected measurement techniques, and their use. Glass transition alone could not be considered as generic rules for food stability criteria since numbers of instances, such as pore formation, diffusion, microbial stability, non-enzymatic browning, other factors or mechanisms play important role. However, it is definitely one of the factors affecting the stability, and a future challenge to combine the glass concept with other mechanisms or factors.

William M. Sischo, Stakeholder position paper: Dairy producer, Preventive Veterinary Medicine, Volume 73, Issues 2-3, Animal Antimicrobial Use Data Collection in the United States: Methodological Options, 24 February 2006, Pages 203-208, ISSN 0167-5877, DOI: 10.1016/j.prevetmed.2005.09.012.
(http://www.sciencedirect.com/science/article/B6TBK-4HK04BP-1/2/8d17e5c8aec72d18a3008d5bdcac2e2b)
Abstract:
Bacterial antimicrobial resistance is a problem common to both animal and public health. An important public policy issue is to develop and implement prudent use practices where antimicrobials are used. As policy develops, there are questions regarding the use of antimicrobials in animal agriculture and whether these uses constitute prudent use. A series of papers assessing the risk to the public health from agricultural use of antimicrobials have consistently concluded that risk estimation is hampered by the lack of data that describe the amount, types, and uses of antimicrobials in animal agriculture. The absence of information has spurred efforts to develop a framework to collect these data. However, the reasons and benefit of collecting these data should be carefully defined. The dairy industry, contrasted to other major animal commodities, is not focused on meat production but on milk production. Milk production is constrained by disease and antimicrobial treatment is a common management tool, but unlike many other animal agricultural systems where the value and safety of the product is measured in the future; the value of milk is zero when an antimicrobial is used in a lactating cow and milk must be discarded because of residues. While there are exceptions, e.g. non-lactating cow therapy, this difference results in antimicrobials being used sporadically and directed at therapy rather than prophylactic uses. In the dairy industry, antimicrobial use data and its consequences may exist in sufficient detail or could be estimated from existing datasets without the expense of additional surveys. Finally, the main food product milk is mainly pasteurized and all shipments of milk from

the farm to the processing plant are tested for the presence of antimicrobials. This makes the likelihood of farm-origin antimicrobials or bacteria appearing in finished product very low. This suggests that the use and quantity of antimicrobials in the dairy system has little impact on public health. This does not imply that the dairy industry does not have a significant role in developing guidelines for appropriate and careful application of antimicrobials, but the effort and cost to collect additional data should be used to fund efforts that improve our diagnostic and managerial skills. These data would change the use of antimicrobials by decreasing the rates of disease and ultimately decreasing prophylactic, metaphylactic and therapeutic use of antimicrobial. These studies and outcome are as important to the dairy industry as to public health.
Keywords: Antimicrobial; Antimicrobial resistance; Dairy

Mustafa Vurma, Yoon-Kyung Chung, Thomas H. Shellhammer, Evan J. Turek, Ahmed E. Yousef, Use of phenolic compounds for sensitizing Listeria monocytogenes to high-pressure processing, International Journal of Food Microbiology, Volume 106, Issue 3, 15 February 2006, Pages 263-269, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.06.025.
(http://www.sciencedirect.com/science/article/B6T7K-4H9YBXX-2/2/a14804488fb765674412b4ee2eea584c)
Abstract:
Three Listeria monocytogenes strains (Scott A, OSY-8578, and OSY-328) that differ considerably in barotolerance were grown to stationary phase and suspended individually in phosphate buffer (pH 7.0). Twelve phenolic compounds, including commercially used food additives, were screened for the ability to sensitize L. monocytogenes to high-pressure processing (HPP). Each L. monocytogenes strain was exposed to each of the 12 phenolic compounds (100 ppm each) for 60 min; this was followed by a pressure treatment at 400 MPa for 5 min. Six phenolic compounds increased the efficacy of HPP against L. monocytogenes but tert-butylhydroquinone (TBHQ) was the most effective. The additives alone at 100 ppm were not lethal for L. monocytogenes. Subsequently, the three L. monocytogenes strains were exposed to TBHQ before or after pressure treatments at 400 or 500 MPa for 5 min. When TBHQ was added after the pressure treatment, the combined treatment was more lethal than was pressure alone. However, the lethality attributable to TBHQ was greater when the additive was applied before rather than after pressure treatment. The inactivation kinetics of the L. monocytogenes strains at 300, 500, and 700 MPa, in the presence or absence of TBHQ, was investigated. All survivor plots showed non-linear inactivation kinetics, but tailing behavior was most pronounced when HPP was used alone. Combinations of TBHQ and HPP eliminated tailing behavior when survivors were monitored by direct plating or an enrichment procedure. Pressure and phenolic additives are apparently a potent bactericidal combination against L. monocytogenes.
Keywords: Listeria monocytogenes; High-pressure processing; Phenolic additives; Tert-butylhydroquinone; Inactivation kinetics; Tailing

N. Chapleau, M. Ritz, S. Delepine, F. Jugiau, M. Federighi, M. de Lamballerie, Influence of kinetic parameters of high pressure processing on bacterial inactivation in a buffer system, International Journal of Food Microbiology, Volume 106, Issue 3, 15 February 2006, Pages 324-330, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.09.009.
(http://www.sciencedirect.com/science/article/B6T7K-4HK049V-1/2/6ecee0898366f8ed6819851c0f4d6e2f)
Abstract:
High pressure processing is recently applied in the food industry to inactivate spoilage and pathogenic microorganisms. Bacterial cells exhibit various barosensibility, and the role of pressurization, depressurization and constant pressure stage remain unknown. We investigated the effect of high pressure processing on Salmonella typhimurium and Listeria monocytogenes cells at 400 and 500 MPa respectively in buffer pH 7 at 20 [degree sign]C. We applied various

pressurization/depressurization kinetic rates (1, 5 and 10 MPa/s for pressurization and 250, 20 and 5 MPa/s for depressurization), and various pulse series or pressure holding times.
Results show that high pressure pulses reduced linearly the number of bacterial cells according to the product of pressure and time: we defined this product as a Barometric Power (BP).
Reduction of both microorganisms increased when holding time increased from 5 to 20 min, and better results were obtained when the rate of pressurization and depressurization were increased.
Keywords: High pressure processing; Bacteria; Listeria monocytogenes; Salmonella typhimurium; Inactivation

S. Pereira-Lorenzo, A.M. Ramos-Cabrer, M.B. Diaz-Hernandez, M. Ciordia-Ara, D. Rios-Mesa, Chemical composition of chestnut cultivars from Spain, Scientia Horticulturae, Volume 107, Issue 3, 6 February 2006, Pages 306-314, ISSN 0304-4238, DOI: 10.1016/j.scienta.2005.08.008.
(http://www.sciencedirect.com/science/article/B6TC3-4HDP7DJ-1/2/98c5bd4f24f25450d22aede514291514)
Abstract:
Chestnut cultivation and production in Spain has employed grafted seedlings from selected local cultivars. Previously, we have characterised the Spanish cultivars by morphological and molecular markers. We are presenting in this paper the proximate analysis and mineral content for the main Spanish cultivars. A total of 131 samples were collected from 47 cultivars in six important Spanish chestnut production regions; located in the North such as Asturias, Castilla-Leon (El Bierzo) and Galicia; in the Central such as Extremadura and in the South such as Andalucia; as well as the Canary Islands, the southermost part of Spain near to North Africa. High variability in chemical composition between cultivars and regions corresponded to the high genetic variability between cultivars. Correlations with environmental parameters were low, indicating that differences found between regions were probably reflecting the differences between cultivars. In Central and Southern Spain, some cultivars presented lowest moisture content due to the low summer rainfall in these regions. Differences in starch and total sugar contents were high and were negatively correlated with each other. There was no negative correlation between nut size and total sugar content. Lowest values of fibre content and ease of digestibility were found in cultivars from Galicia and Extremadura. No significant differences in Fe, Zn and Cu were found although Zn content is twice the value reported for European chestnuts. This work would be a valuable reference to chestnut quality for the food processing industry, nutritionists, breeders and growers alike.
Keywords: Castanea sativa; Starch; Total sugars; Fibre; Fat; Ashes; Proteins; Minerals

Ana M. Gonzalez-Paramas, Fatima Lopes da Silva, Pilar Martin-Lopez, Glenda Macz-Pop, Susana Gonzalez-Manzano, Cristina Alcalde-Eon, Jose Joaquin Perez-Alonso, M.Teresa Escribano-Bailon, Julian C. Rivas-Gonzalo, Celestino Santos-Buelga, Flavanol-anthocyanin condensed pigments in plant extracts, Food Chemistry, Volume 94, Issue 3, February 2006, Pages 428-436, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.11.037.
(http://www.sciencedirect.com/science/article/B6T6R-4FH0DBK-3/2/0f05716dc36bcd792f36542a52a3592e)
Abstract:
Pigments resulting from the direct condensation of anthocyanins and flavanols are usually associated with reactions taking place during processing and storage of plant-derived foods and beverages and have been particularly studied in aged red wines. In this paper, small amounts of flavanol-anthocyanin condensed pigments are found in different plant extracts. Structures are suggested for 10 such condensed pigments detected in extracts of strawberry, runner beans, purple corn and grape skins, based on their MSn fragmentation patterns, following analyses by electrospray tandem mass spectrometry. All of them correspond to dimers containing a flavan-3-ol [either (epi)afzelechin, (epi)catechin or (epi)gallocatechin] as the upper unit carbon-carbon linked to a lower anthocyanin unit consisting of different delphinidin, cyanidin, pelargonidin, peonidin or

malvidin derivatives. The detection of these pigments in plant extracts may suggest that they are natural pigments and not products exclusively formed during storage and ageing of processed foods and beverages, as was previously assumed.
Keywords: Flavanol-anthocyanin; Condensed pigments; Strawberry; Runner bean; Purple corn; Grape skin

Massimo Bertolini, Maurizio Bevilacqua, Roberto Massini, FMECA approach to product traceability in the food industry, Food Control, Volume 17, Issue 2, February 2006, Pages 137-145, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.09.013.
(http://www.sciencedirect.com/science/article/B6T6S-4DVBHXF-8/2/a94011f591aae33a3ba9d5774c11b121)
Abstract:
The traceability system in the farming and food supply chain can be described as the documented identification of the operations which lead to the production and sale of a product. Its objective is to identify the actors involved and trace the relevant flows, precisely characterizing the material and processing or management operations that contribute to the production of the final items. The traceability system must be efficient and effective, accurately collecting the necessary information and enabling a rapid and correct reuse of this information.
This paper presents an application of the industrial engineering tool `Failure Mode Effect and Criticality Analysis' (FMECA) to the production process in the farming and food industries, as this tool is aimed at detecting the possible critical points of its traceability system (whether in use or undergoing implementation), and at proposing improvements.
Keywords: Food traceability; Food safety; Failure Mode Effect and Criticality Analysis (FMECA)

A.S. Angelidis, E.N. Chronis, D.K. Papageorgiou, I.I. Kazakis, K.C. Arsenoglou, G.A. Stathopoulos, Non-lactic acid, contaminating microbial flora in ready-to-eat foods: A potential food-quality index, Food Microbiology, Volume 23, Issue 1, February 2006, Pages 95-100, ISSN 0740-0020, DOI: 10.1016/j.fm.2005.01.015.
(http://www.sciencedirect.com/science/article/B6WFP-4GFTY93-B/2/abc617ea5f4ab9f7bcb33ff325164785)
Abstract:
The bacteriological profile of 87 samples of commercially available ready-to-eat (RTE) dairy and meat-products, packaged sandwiches and salads was obtained by testing for aerobic colony count, for lactic acid bacterial (LAB) count, for the presence and the extent of non-LAB microflora (contaminating microflora), and by testing for certain food-borne pathogens. The pathogens Listeria monocytogenes, Salmonella spp. and sulfite-reducing clostridia were not detected in any of the analysed samples. Whereas only three samples (3.4%) were deemed unacceptable for consumption for exceeding the established pathogen tolerance levels (for Staphylococcus aureus and Escherichia coli), several samples were found to contain non-lactic acid contaminating microflora of considerable magnitude. The log10 cfu g-1 counts for contaminating microflora in the food categories examined were as follows: hard cheeses 4.85 (SD 1.17); semi-hard cheeses 5.39 (SD 1.37); soft cheeses 5.13 (SD 1.03); whey cheeses 6.55 (1.24); fermented meat-products 4.18 (SD 1.48); heat-treated meat-products 3.47 (SD 1.99); salads 3.37 (SD 1.56) and sandwiches 5.04 (SD 0.96). Approximately 1 in every 30 to 80 bacterial cells found on different types of cheeses and salads was a non-LAB microorganism; the respective ratios for fermented meat-products, heat-treated meat-products and sandwiches were 1 in 6, 2.5 and 15. The assessment of the contaminating microflora magnitude at various steps during the manufacture and distribution of RTE foods can serve as an index for monitoring the microbiological quality of the starting materials, the sanitation efficacy during processing and possible temperature abuse during processing, transportation or storage.
Keywords: Ready-to-eat foods (RTE); Contaminating flora; Microbiological quality

Tatiana Koutchma, Improving the thermal processing of foods, Woodhead Publishing limited, ISBN 1 85573 730 2, CRC Press, ISBN 0-8493-2549-6, ([pound sign] 150.00/US$270.00/[euro]220.00)., Food Microbiology, Volume 23, Issue 1, February 2006, Pages 101-102, ISSN 0740-0020, DOI: 10.1016/j.fm.2005.01.008.
(http://www.sciencedirect.com/science/article/B6WFP-4GFTY93-C/2/a0e458db1e634a3422b8013772ae2dda)

Stephen P.J. Brooks, Roger Mongeau, Josephine R. Deeks, Brian J. Lampi, Rene Brassard, Dietary fibre in baby foods of major brands sold in Canada, Journal of Food Composition and Analysis, Volume 19, Issue 1, February 2006, Pages 59-66, ISSN 0889-1575, DOI: 10.1016/j.jfca.2005.02.002.
(http://www.sciencedirect.com/science/article/B6WJH-4HC0VTH-5/2/0d7fe4554b1c6aa5826dd0e06462f94a)
Abstract:
Total dietary fibre (TDF) was measured using the rapid gravimetric method (AOAC 992.16) in 88 infant foods available in the Canadian marketplace. The sampling included 1-8 different lots (depending on availability) and indicated approximately equal TDF values in vegetable products (1.48+/-0.78 g/100 g, n=13), fruit products (1.23+/-0.83 g/100 g, n=26) and cereal products (0.78+/-0.35 g/100 g, n=39) when compared on a 'ready-to-eat' basis. Ready-to-eat dinners and meat products had significantly lower TDF content (0.41+/-0.17 g/100 g, n=13). Individual TDF values ranged from 3 g/100 g 'as is' (junior peas) and 2.9 g/100 g as is (toddler Bartlett pears) to 0.16 g/100 g as is (custard plain w/arrowroot, banana and butterscotch) and 0.15 g/100 g as is (toddler chicken with rice). In some cases, infant foods had higher soluble dietary fibre/insoluble dietary fibre ratios than the published values for similar adult foods suggesting that processing of infant foods has occurred. Calculations using the TDF content of these foods revealed that they may be adequate in preparing infants for dietary patterns that approach recent Institute of Medicine recommendations of 19 g/d for infants between 1 and 3 years of age.
Keywords: Infant foods; Total dietary fibre; Soluble dietary fibre; Insoluble dietary fibre; Nutrition; Recommendations

, Position of the American Dietetic Association: Agricultural and Food Biotechnology, Journal of the American Dietetic Association, Volume 106, Issue 2, February 2006, Pages 285-293, ISSN 0002-8223, DOI: 10.1016/j.jada.2005.12.017.
(http://www.sciencedirect.com/science/article/B758G-4J4HD07-S/2/e806a74261541ba3d3d376c15b4793ee)
Abstract:
It is the position of the American Dietetic Association that agricultural and food biotechnology techniques can enhance the quality, safety, nutritional value, and variety of food available for human consumption and increase the efficiency of food production, food processing, food distribution, and environmental and waste management. The American Dietetic Association encourages the government, food manufacturers, food commodity groups, and qualified food and nutrition professionals to work together to inform consumers about this new technology and encourage the availability of these products in the marketplace.

Ruth M. Casper, Nicholas J. Gales, Mark A. Hindell, Sarah M. Robinson, Diet estimation based on an integrated mixed prey feeding experiment using Arctocephalus seals, Journal of Experimental Marine Biology and Ecology, Volume 328, Issue 2, 24 January 2006, Pages 228-239, ISSN 0022-0981, DOI: 10.1016/j.jembe.2005.07.009.
(http://www.sciencedirect.com/science/article/B6T8F-4GX0CRY-1/2/ff9825bbb54d3a8f0be113e579e241a5)

Abstract:
Food web models depend on identifying which taxa are eaten and in what proportion they are consumed. Arctocephalus seals are generalist foragers and are an ongoing focus of Southern Hemisphere marine ecosystem research. This is the first feeding experiment to use Arctocephalus spp. to assess the utility of hard part scat analysis for diet estimation, based on mixed prey diets integrated over several days. Recovery rates of otoliths were extremely low for all taxa (0-9%). Although we could not collect scats produced during a 90 min period each day, during which the seals had access to a large pool, this result could not be attributed to otolith robustness, pinniped species or class, activity level, meal size or frequency, or fat content of the diet. We conclude that the unusually low recovery rates in this study may be due to unaccounted scats produced during 90 min of each day, if they contained otolith numbers an order of magnitude greater than all otoliths retrieved from scats produced during the other 22.5 h of each day, and/or may be related to the digestive processing of a mixed prey diet. Our study demonstrates the inadequacy of using otoliths in field collected scats for diet estimation due to the high level of unexplained variability of otolith occurrence in scats. We also identify two new potential sources of this variability. These are variability in numbers of otoliths per scat depending on activity level when a scat is excreted, and variability in recovery rates of otoliths as a function of the complexity of the diet.
Keywords: Arctocephalus; Diet estimation; Feeding experiment; Fur seal; Scats

E.H. Tou, J.P. Guyot, C. Mouquet-Rivier, I. Rochette, E. Counil, A.S. Traore, S. Treche, Study through surveys and fermentation kinetics of the traditional processing of pearl millet (Pennisetum glaucum) into ben-saalga, a fermented gruel from Burkina Faso, International Journal of Food Microbiology, Volume 106, Issue 1, 15 January 2006, Pages 52-60, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.05.010.
(http://www.sciencedirect.com/science/article/B6T7K-4H9PMWP-2/2/6afdf95641466e0bf084c0cc1b159421)
Abstract:
Traditional cereal-based fermented foods are frequently used as complementary foods for infants and young children in Africa. This is the case for ben-saalga, a popular fermented gruel produced from pearl millet (Pennisetum glaucum) in Burkina Faso. Detailed knowledge of traditional processing is a prerequisite for investigating ways to improve both the nutritional and sanitary qualities of the corresponding foodstuff. In this work, the traditional processing of pearl millet into ben-saalga was investigated in 24 production units, and fermentation kinetics were studied in pilot scale experiments. Processing steps include: washing (optional), soaking of the grains (first fermentation step), grinding and sieving of the wet flour, settling (second fermentation step), and cooking. The soaking step was mainly characterized by alcoholic fermentation whereas lactic acid fermentation occurred during the settling step. Fermentation kinetics during settling indicates a temporal variation of metabolic activity. Initially, both homofermentative and heterofermentative pathways were simultaneously active, and later only a homofermentative pathway was active. The paste produced at the end of settling had a low pH (4.0 +/- 0.4) and its microflora was dominated by lactic acid bacteria (LAB) with an amylolytic LAB/LAB ratio of 12%. Sucrose disappeared in the grains during soaking but was not detected in the soaking water, whereas glucose, fructose and maltose appeared transiently. Glucose and fructose were the main substrates observed for lactic acid fermentation during the settling step; however unbalanced fermentation led to the hypothesis that starch hydrolysis products may also serve as substrates for lactic acid formation. At the end of the processing, a 75% and 83% decrease was observed in phytate (IP6) and raffinose, respectively. The sour gruel ben-saalga resulting from cooking the sour paste had inadequate nutritional characteristics with respect to infants' and young children's requirements; it was characterized by fluid consistency (Bostwick flow: 137 mm/30 s) and low energy density (about 30 kcal/100 g of gruel).

Keywords: Lactic acid fermentation; Pearl millet; Complementary food; Phytate; [alpha]-Galactoside; Amylolytic lactic acid bacteria

F. Delfour, K. Marten, Lateralized visual behavior in bottlenose dolphins (Tursiops truncatus) performing audio-visual tasks: The right visual field advantage, Behavioural Processes, Volume 71, Issue 1, 10 January 2006, Pages 41-50, ISSN 0376-6357, DOI: 10.1016/j.beproc.2005.09.005.
(http://www.sciencedirect.com/science/article/B6T2J-4HCMSFG-1/2/8feab9c4f87b0e10041cc54ef427fc0c)
Abstract:
Analyzing cerebral asymmetries in various species helps in understanding brain organization. The left and right sides of the brain (lateralization) are involved in different cognitive and sensory functions. This study focuses on dolphin visual lateralization as expressed by spontaneous eye preference when performing a complex cognitive task; we examine lateralization when processing different visual stimuli displayed on an underwater touchscreen (two-dimensional figures, three-dimensional figures and dolphin/human video sequences). Three female bottlenose dolphins (Tursiops truncatus) were submitted to a 2-, 3- or 4-, choice visual/auditory discrimination problem, without any food reward: the subjects had to correctly match visual and acoustic stimuli together. In order to visualize and to touch the underwater target, the dolphins had to come close to the touchscreen and to position themselves using monocular vision (left or right eye) and/or binocular nasoventral vision. The results showed an ability to associate simple visual forms and auditory information using an underwater touchscreen. Moreover, the subjects showed a spontaneous tendency to use monocular vision. Contrary to previous findings, our results did not clearly demonstrate right eye preference in spontaneous choice. However, the individuals' scores of correct answers were correlated with right eye vision, demonstrating the advantage of this visual field in visual information processing and suggesting a left hemispheric dominance. We also demonstrated that the nature of the presented visual stimulus does not seem to have any influence on the animals' monocular vision choice.
Keywords: Cognition; Dolphin; Eye preference; Lateralized behavior; Tursiops truncatus

Danielle Steel, Eva Kemps, Marika Tiggemann, Effects of hunger and visuo-spatial interference on imagery-induced food cravings, Appetite, Volume 46, Issue 1, January 2006, Pages 36-40, ISSN 0195-6663, DOI: 10.1016/j.appet.2005.11.001.
(http://www.sciencedirect.com/science/article/B6WB2-4HVDYDF-3/2/81c9c9315e5177e29c1065c43746fa28)
Abstract:
The present study investigated the effects of hunger and visuo-spatial interference on imagery-induced food cravings. Forty-two women were randomly assigned to a hungry (no food for prior 4 h) or not hungry condition. Participants were asked to form and maintain images of desired foods while looking at a blank computer screen (control condition) or performing a task designed to load the visuo-spatial sketchpad of working memory (dynamic visual noise). They then rated the vividness of their images and their craving intensity. Although hungry participants reported stronger food cravings, dynamic visual noise made images less vivid and cravings less intense, irrespective of participant hunger status. Thus concurrent visuo-spatial processing may offer a useful technique for treating problematic food cravings that are predominantly psychological in origin, as well as those that are hunger-driven.
Keywords: Food cravings; Hunger; Imagery; Working memory; Visuo-spatial sketchpad

George Nakhla, Andrew Lugowski, Javnika Patel, Victor Rivest, Combined biological and membrane treatment of food-processing wastewater to achieve dry-ditch criteria: Pilot and full-scale performance, Bioresource Technology, Volume 97, Issue 1, January 2006, Pages 1-14, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.03.034.

(http://www.sciencedirect.com/science/article/B6V24-4G94HG4-2/2/fee48e9199ffb3b1d75046bd435e07c6)
Abstract:
This study tested the applicability of a submerged vacuum ultrafiltration membrane technology in combination with the biological treatment system to achieve dry-ditch criteria stipulated as follows: BOD5, TSS, NH3-N, and total phosphorous (TP) concentration not exceeding 10, 10, 1, and 0.5 mg/L respectively for the treatment of high strength food-processing wastewater. During the study, the biological system, operated at average hydraulic retention time of 5-6 days, achieved 95-96.5% BOD removal and 96-99% COD removal. The external membrane system ensured the achievability of the BOD and TSS criteria, with BOD and TSS concentrations in the permeate of 1-2 and 1-8 mg/L respectively. Nitrate, and nitrite concentrations increased during membrane filtration, while ammonia concentrations decreased. The most salient finding of this study is that, contrary to common belief, for industrial wastewaters, the filterability of the mixed liquor is influenced by the soluble organics, and may be low, thus necessitating operation of bioreactors at low mixed liquor solids. This study demonstrated that bioreactors operated at low SRTs and in combination with ultrafiltration can still achieve superior effluent quality that may meet reuse criteria at reasonable cost.
Keywords: Suspended solids; Biological treatment; Ultrafiltration membrane; Food-processing.

Vural Gokmen, Hamide Z. Senyuva, Study of colour and acrylamide formation in coffee, wheat flour and potato chips during heating, Food Chemistry, Volume 99, Issue 2, 2006, Pages 238-243, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.06.054.
(http://www.sciencedirect.com/science/article/B6T6R-4H87GNS-4/2/8c64bc5634f7a3870a6f256239e97773)
Abstract:
The effects of heating on colour generation measured as CIE colour space parameters of L* a* b* and acrylamide formation were studied in various food matrices including green coffee, wheat flour and potato chips at different temperatures. Changes in both the acrylamide concentration and the redness parameter a* during heating at relatively higher temperatures followed a typical kinetic pattern in which an initial increase to an apparent maximum followed by a subsequent decrease was observed. The similarities between the changes in acrylamide and redness parameter a* during heating revealed that colour may be a reliable indicator of acrylamide levels in thermally processed foods. The overall results suggest that both acrylamide and redness parameter a* form as intermediate products during Maillard reaction. Since an apparent decrease was observed in its level during prolonged heating at certain temperatures, prediction of acrylamide level in foods during processing should be based on realistic reaction mechanism, instead of simple linear regression model.
Keywords: Acrylamide; Colour; Heating; Green coffee; Wheat flour; Potato chips

Francisco Javier Castillo-Yanez, Ramon Pacheco-Aguilar, Fernando Luis Garcia-Carreno, Maria de los Angeles Navarrete-Del Toro, Martha Felix Lopez, Purification and biochemical characterization of chymotrypsin from the viscera of Monterey sardine (Sardinops sagax caeruleus), Food Chemistry, Volume 99, Issue 2, 2006, Pages 252-259, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.06.052.
(http://www.sciencedirect.com/science/article/B6T6R-4HB4DM4-1/2/ba7b4f3700796a917d095e2ffb4e84e6)
Abstract:
Chymotrypsin was isolated from the viscera of Monterey sardine by ammonium sulphate fractionation, gel filtration, and ionic exchange chromatography. The approximate molecular weight was 26,000 and its isoelectric point was about 5. Identity as chymotrypsin was established by its catalytic specificity for amide or ester bonds on the synthetic substrates succinyl-l-ala-ala-pro-l-

pheilalanine-p-nitroanilide and benzoyl-l-tyrosine-ethyl-ester, showing esterase activity 3.2-fold higher than amidase. It was inhibited by phenylmethylsulfonyl-fluoride and soybean trypsin inhibitor, partly inhibited by the specific chymotrypsin inhibitor N-toluenesulfonyl-l-phenylalanine chloromethyl-ketone, but not inhibited by EDTA or Benzamidine. Chymotrypsin showed its maximum activity at pH 8.0 and 50 [degree sign]C for the hydrolysis of SAAPNA. The Michaelis-Menten constant was 0.074 mM with a catalysis constant of 18.6 seg-1, and catalytic efficiency of 252 seg-1 mM-1. Results indicated that Monterey sardine chymotrypsin is a good catalyst and could be used as a biotechnological tool in food processing and using sardine industry wastes as a material for production of fine reagents.
Keywords: Monterey sardine; Chymotrypsin; Biochemical characterization; Viscera; Purification; Chromatography; Enzyme activity

K.R. Sridhar, S. Seena, Nutritional and antinutritional significance of four unconventional legumes of the genus Canavalia - A comparative study, Food Chemistry, Volume 99, Issue 2, 2006, Pages 267-288, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.07.049.
(http://www.sciencedirect.com/science/article/B6T6R-4H6PKXK-7/2/90022b88ca5d5b42c8cc6860a78cc37e)
Abstract:
Developing countries are under the clutch of malnutrition due to a lack of protein rich food. Protein supply can be broadened by exploration and exploitation of alternative legume sources. Even though many wild legume landraces have been identified, their utilization is limited due to insufficient attention. Canavalia gladiata, Canavalia ensiformis, Canavalia maritimaand Canavalia cathartica are the common under-exploited legume species having the potential to be a rich protein source. This review envisages a comparative account of nutritional, antinutritional and functional properties and emphasizes the various methods employed in seed processing of Canavalia spp. The current study helps in understanding the nutritional and antinutritional versatility/potential of four Canavalia spp., thereby developing future strategies for optimum utilization.
Keywords: Canavalia; Wild legumes; Proteins; Energy; Essential amino acids; Concanavalin A; Detoxification

Jun-Ho Hwang, Kwang-Geun Lee, Reduction of aflatoxin B1 contamination in wheat by various cooking treatments, Food Chemistry, Volume 98, Issue 1, 2006, Pages 71-75, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.04.038.
(http://www.sciencedirect.com/science/article/B6T6R-4GSJXT6-2/2/e30fbe111fca25c3180faaf6e4cb9316)
Abstract:
To investigate the effects of various cooking treatments such as washing, heating and steaming on the reduction of aflatoxin toxicity, a simultaneous analytical method for aflatoxin B1, B2, G1, G2 was established using high performance liquid chromatography (HPLC) with a fluorescence detector. The levels of aflatoxin B1 (AFB1) spiked in wheat--three varieties of United States (US) wheat and two varieties of Korean wheat--were analyzed according to washing time and heating temperature. Reduction of AFB1 toxicity was directly proportional to washing time in both Korean and US wheat. The concentration of AFB1 was reduced more by heating than washing treatment. The level of AFB1 in dried wheat was decreased to 50% and 90% by heating at 150 and 200 [degree sign]C, respectively. However, the reduction of AFB1 in wet wheat in which water (10%) was intentionally added was higher by heating than in dried wheat. The reduction of AFB1 was increased by 8% and 23% in 10% water-added US wheat (soft red white wheat) and Korean wheat (Anbaekmil) compared to dried US and Korean wheat, respectively, through heat treatment. Traditional processing used in Korean foods such as Sujebi (a soup with wheat flakes) and steamed bread caused 71% and 43% decrease in aflatoxin B1 content.

Keywords: Aflatoxin B1; Toxicity reduction; Cooking; Wheat; High performance liquid chromatography (HPLC)

C. Martinez-Villaluenga, J. Frias, C. Vidal-Valverde, Functional lupin seeds (Lupinus albus L. and Lupinus luteus L.) after extraction of [alpha]-galactosides, Food Chemistry, Volume 98, Issue 2, 2006, Pages 291-299, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.05.074.
(http://www.sciencedirect.com/science/article/B6T6R-4GX6J8J-1/2/7cf97e1b2a19b9d82cc1fe709c234b07)
Abstract:
Functional lupin seeds from two different cultivars of white (Lupinus albus L.) and yellow lupin (Lupinus luteus L.) each, were obtained by extraction of [alpha]-galactosides. The effect of extraction of [alpha]-galactosides from lupin seeds on different nutritional parameters (protein, fat, ash, dietary fibre, starch, sucrose, and vitamins B1, B2, E and C) and antinutritional factors ([alpha]-galactosides, trypsin inhibitor activity and inositol phosphates) were studied. In lupin seeds, [alpha]-galactosides were effectively removed and processed seeds contained very low amounts of flatulence causing factors (~0.5-1%). Protein, fat and starch contents showed high retention in processed seeds (up to ~130%). Sucrose and soluble dietary fibre, however, decreased significantly as a result of processing and retentions ranged from 10% to 60%, depending on the variety studied. Vitamins B1, B2, E and C were also reduced. Trypsin inhibitor activity was detected only in yellow lupin cultivars and inositol phosphate content was modified slightly after extraction. In summary, the functional lupin seeds, with low contents of [alpha]-galactosides, are a product of nutritional importance due to their high protein content, dietary fibre and fat contents as well as acceptable levels of thiamin, riboflavin and vitamin E. They can be incorporated as a proteic source, not only in animal feeding but also in a wide range of foods.
Keywords: [alpha]-Galactosides; Raffinose family oligosaccharides; Lupin; Functional

Agnieszka Sujak, Anna Kotlarz, Waclaw Strobel, Compositional and nutritional evaluation of several lupin seeds, Food Chemistry, Volume 98, Issue 4, 2006, Pages 711-719, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.06.036.
(http://www.sciencedirect.com/science/article/B6T6R-4HS3C37-1/2/84ad285fbed3bc3da14689ce3a5b92a4)
Abstract:
Lupin seeds of different species representing diverse varieties of sweet lupin grown in Poland were investigated. The chemical compositions of lupin isolates and amino acid composition of the proteins, as well as the nutritive values were estimated. No significant differences (P [greater-or-equal, slanted] 0.05) were observed among lupin isolates in their dry matter, crude fibre or alkaloid contents. The highest protein content (465 +/- 11 g/kg d.m.) was found in seeds from lupins belonging to Lupinus luteus (P [less-than-or-equals, slant] 0.01), while the highest oil content (ca. 115 g/kg d.m.) was found in Lupinus albus (P [less-than-or-equals, slant] 0.05).
All the species examined were characterised by a shortage of methionine, lysine, tryptophan and valine while the level of leucine was satisfactory for most of the species. Yellow lupin was deficient in isoleucine. White lupin was found to be a nutritionally more valuable crop than other species by the standards of nutrition for mature human and animals. Apart from the highest level of amino acids within the crude protein (AA - 97.7 g/16 gN, P [less-than-or-equals, slant] 0.01), it was found to have a better and nutritionally more beneficial amino acid composition and the highest essential amino acids level (EAA). White lupin was characterised by a higher essential amino acid index (EAAI) as well as chemical score (CS) of restrictive amino acids, and the highest protein efficiency ratio (PER), expressed in terms of the availability of leucine and tyrosine as compared to blue and yellow lupin varieties. White lupin, followed by blue and yellow lupin, was found to be suitable for animal feeding as well as for the production of high-protein concentrates for further food processing and use in animal and human nutrition.

Keywords: Lupinus luteus; Lupinus albus; Lupinus angustifolius; Chemical composition; Nutritional values

Elizabeth Aparecida Ferraz da Silva Torres, Maria Lima Garbelotti, Jose Machado Moita Neto, The application of hierarchical clusters analysis to the study of the composition of foods, Food Chemistry, Volume 99, Issue 3, 2006, Pages 622-629, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.08.032.
(http://www.sciencedirect.com/science/article/B6T6R-4H877SK-J/2/c06b21410e7437fc1ad4bb8dfa1a7052)
Abstract:
The nutritional value of prepared foods is frequently questioned or requested at restaurants by its costumers. Therefore, this paper aimed to apply HCA to categorize foods according to their nutritive values. Fifty three samples of prepared foods from four different restaurants were analyzed for proximate composition using the AOAC methods [AOAC (1995). Association of Official Analytical Chemists. Official method of analysis. Arlington, Cereal foods, Supplement (pp. 7-11).]. The multivariate statistical analysis of data using the hierarchical cluster analysis (HCA) technique was obtained through the SPSS (10.0) program. French fries were the most caloric preparation; they also have considerable total fiber content. Milled white rice is rich in carbohydrates; and calories and fiber-poor. Arugula offers the highest protein and total fiber content, whereas lettuce presented the smallest amount of these two nutrients. Beans are the main source of dietary fiber and have a low caloric value. The most caloric preparations are French fries and fried zucchini Milanese Type of processing employed in preparing the foods might account for the variation in results between the establishments studied HCA was a useful guide for looking at and analyzing the different types of foods comparatively. Given how easy it is to calculate this with software, it is recommendable to be used even as an exploratory tool, capable of aiding intuition in the analysis of the set of data. HCA can be useful guide/tools to educate consumers on the nutritive values of foods selling in a restaurant and to help the consumers to select the foods which are suitable to their help, if required.
Keywords: Proximate composition; Dietary fiber; 'By weight' restaurants; Hierarchical clusters analysis; HCA

Nagendran Balasundram, Kalyana Sundram, Samir Samman, Phenolic compounds in plants and agri-industrial by-products: Antioxidant activity, occurrence, and potential uses, Food Chemistry, Volume 99, Issue 1, 2006, Pages 191-203, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.07.042.
(http://www.sciencedirect.com/science/article/B6T6R-4H877SK-1/2/9b38b5439d0684fe6d30f48d1a38d4a5)
Abstract:
Phenolic compounds, ubiquitous in plants are an essential part of the human diet, and are of considerable interest due to their antioxidant properties. These compounds posses an aromatic ring bearing one or more hydroxyl groups and their structures may range from that of a simple phenolic molecule to that of a complex high-molecular weight polymer. Flavonoids, which bear the C6-C3-C6 structure, account for more than half of the over eight thousand different phenolic compounds. The antioxidant activity of phenolic compounds depends on the structure, in particular the number and positions of the hydroxyl groups and the nature of substitutions on the aromatic rings. Fruits, vegetables and beverages are the major sources of phenolic compounds in the human diet. The food and agricultural products processing industries generate substantial quantities of phenolics-rich by-products, which could be valuable natural sources of antioxidants. Some of these by-products have been the subject of investigations and have proven to be effective sources of phenolic antioxidants. When tested in edible oils, and in fish, meat and poultry products, phenolic-rich extracts have shown antioxidant activities comparable to that of synthetic

antioxidants. Practical aspects of extraction and production of sufficient amounts of natural antioxidants from most of these sources remain to be elucidated.
Keywords: Phenolic compounds; Polyphenols; Flavonoids; Antioxidants

Luc Pussemier, Yvan Larondelle, Carlos Van Peteghem, Andre Huyghebaert, Chemical safety of conventionally and organically produced foodstuffs: A tentative comparison under Belgian conditions, Food Control, Volume 17, Issue 1, January 2006, Pages 14-21, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.08.003.
(http://www.sciencedirect.com/science/article/B6T6S-4DN13NP-1/2/bb951051c0d021550d8cef56f00ab4d7)
Abstract:
This paper goes through the chemical risks able to affect the organic and the conventional agro-food products. For each type of contaminant a tentative assessment has been made in considering not only the levels of exposure but also the toxicological data when available. When comparing both production systems with regards to food safety, it appears that, for the well-known toxicants (pesticides, nitrates), organic products present some clear advantages, but it is also recognized that natural toxicants need to be better identified within this mode of production. Environmental and food processing contaminants are present in both organic and conventional products. It is recommended to improve the monitoring programmes by paying more attention to the mode of production as well as to the whole array of relevant contaminants.
Keywords: Chemical contaminants; Organic agriculture; Conventional agriculture

R.A. de Wijk, J.F. Prinz, A.M. Janssen, Explaining perceived oral texture of starch-based custard desserts from standard and novel instrumental tests, Food Hydrocolloids, Volume 20, Issue 1, January 2006, Pages 24-34, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2005.02.008.
(http://www.sciencedirect.com/science/article/B6VP9-4G7GFV1-1/2/7c8e63b21f362af27a0571b43d420d44)
Abstract:
A number of in vitro and in vivo instrumental tests have been developed to reflect various aspects of the perceived oral texture of starch-based vanilla custard desserts. These tests include measurements of the food's infra-red reflectance (IRR), of the turbidity of spat-out rinse water, and of the friction between the food and the oral tissue. Also, images of spat-out foods have been digitally processed and image-processing parameters extracted. These tests, together with conventional rheological tests, were carried out on a set of vanilla custard desserts that varied systematically with respect to fat content (0-15%), starch content (3.3-5.1%), and type of modified starch (potato, tapioca, and waxy maize starch with various degrees of cross-liking) judged by nine highly trained QDA panelists. Three sensory dimensions could be identified from principal component analysis to summarize the sensory texture space of the custards. The results from instrumental measurements, together with the effects of ingredients, indicated that the fist dimension, running from roughness to creaminess, was related to lubrication. The second dimension, running from melting to thickness, was related to stimulus viscosity. Finally, the third dimension, running from airy to heterogeneous, was related to starch type. The results indicate that each sensory dimension has attributes that are either related to surface properties or to bulk properties of the food bolus and that saliva--and starch break-down by salivary amylase--should be incorporated into instrumental measurements. Key sensory attributes from all three dimensions were predicted well from instrumental measurements.
Keywords: Oral texture; Starch concentration; Starch type; Fat; Friction; Imaging; Turbidity; IRR; Rheology; Multivariate statistics; Sensory; Creaminess

Claudio Peri, The universe of food quality, Food Quality and Preference, Volume 17, Issues 1-2, The First European Conference on Sensory Science of Food and Beverages: 'A Sense of Identity', January-March 2006, Pages 3-8, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2005.03.002.
(http://www.sciencedirect.com/science/article/B6T6T-4G1R3PM-2/2/f28a070f9d4cf8f15527e78191ca1823)
Abstract:
The universe of food quality is presented as a system of product requirements both material and immaterial, related to the product in itself, the production context, the product-packaging system, and the product-market system. Also, the dynamics of the quality system is shown as a relationship between processing conditions, product characteristics, product performance, and consumer requirements. All this poses the problem of methods and strategies for studying/optimising the overall quality of food products. Two approaches are presented: (a) pyramiding by comparing pairs of antithetic consumer requirements, and (b) minimizing rejection as a more useful approach than maximizing preferences. It is suggested that sensory science be considered as the 'science of quality perception'.
Keywords: Food quality; Sensory; Consumer

Radhika K. Apaiah, Anita R. Linnemann, Hedzer J. van der Kooi, Exergy analysis: A tool to study the sustainability of food supply chains, Food Research International, Volume 39, Issue 1, January 2006, Pages 1-11, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.04.006.
(http://www.sciencedirect.com/science/article/B6T6V-4GSJXDP-1/2/3e2101d0e593d70bd63b591f7af73e3a)
Abstract:
This paper explores the potential of using exergy analysis to study and compare the environmental impact of food supply chains. The method identifies the links where exergy destruction takes place and shows where improvements are possible to minimize this destruction. The supply chains of three products were investigated: pork mincemeat, novel protein food (NPF) made from dry peas and pea soup. Exergy content and requirements of the various streams, products and processes were calculated for the three chains. As exergy is expressed in one unit, the Joule, the inputs and outputs of each chain are easily comparable. The contributions of the links to the total exergy loss are different in each chain. In the NPF chain, greatest input is required in the processing link whereas for the pork chain, primary processing and transportation require the highest inputs. The NPF chain is only slightly more efficient (1.2 times) than the pork meat chain. Such analyses are also useful in the design and redesign of supply chains.
Keywords: Exergy; Food supply chain; Environmental impact; Novel protein food

M.D. Toews, J.F. Campbell, F.H. Arthur, Temporal dynamics and response to fogging or fumigation of stored-product Coleoptera in a grain processing facility, Journal of Stored Products Research, Volume 42, Issue 4, 2006, Pages 480-498, ISSN 0022-474X, DOI: 10.1016/j.jspr.2005.08.003.
(http://www.sciencedirect.com/science/article/B6T8Y-4J0X8B9-1/2/cbc459b4a533a0db818e1fc9e92c1e21)
Abstract:
Stored-product Coleoptera were monitored continuously over 22 months using pitfall traps at an operating food mill and adjacent warehouse in Kansas. Mill management practiced conventional pest management, including monthly crack and crevice applications of a residual insecticide and semi-annual fumigation with methyl bromide in the mill, and application of dichlorvos+pyrethrin (commonly called fogging) in the warehouse. The dynamic temporal changes in insect captures and effect of the global interventions on insect captures were analyzed. Data show that more Trogoderma variabile individuals were captured in the warehouse than any other species, but Tribolium castaneum was captured with greater frequency. Trogoderma variabile captures inside

the warehouse tended to mirror outside captures suggesting immigration from the outside. The food mill was infested year round with T. castaneum but developed substantial populations of Typhaea stercorea during the warm months from May through October. Stored-product insects were nearly always captured during the first trapping interval following methyl bromide or dichlorvos+pyrethrin applications, but it was not clear if the insects were surviving inside the structure or if they were rapidly recolonizing after treatment. Population increases immediately following fumigation or fogging occurred only in fungus-feeding species in late spring or summer. The most successful fumigation was conducted late in the autumn when environmental conditions prevented insect activity outside. Information contained in this study provides data that could be used to improve insect management programs for milling and processing facilities.
Keywords: Tribolium castaneum; Traps; Stored products; Methyl bromide; Monitoring; Food mill

Naoya Kasai, Toshio Suzuki, Hideaki Idogaki, Enzymatic degradation of esters of dichloropropanols: removal of chlorinated glycerides from processed foods, LWT - Food Science and Technology, Volume 39, Issue 1, January 2006, Pages 86-90, ISSN 0023-6438, DOI: 10.1016/j.lwt.2004.11.005.
(http://www.sciencedirect.com/science/article/B6WMV-4F29SKX-1/2/26902aeb2e0d4b45c2bada98cd63d152)
Abstract:
The esters of dichloropropanols from the byproduct of hydrolysates during food processing were degraded by the cell-free extracts of a dichloropropanol-assimilating bacterium of Pseudomonas sp. OS-K-29. 1-Acyloxy-2,3-dichloropropane was hydrolysed into the corresponding carbonic acid and 2,3-dichloropropanol, and then the dichloropropanol was dechlorinated. The esterase activity of the cell-free extracts was effective for the esters of the dichloropropanols and monoacylglycerides, but not for hydrolysing the lipase substrates such as triacylglycerides and Tween 60. A comparative study using a series of octanoyl glycerides and the esters of the dichlopropanols showed that the substrate specificities of the cell-free extracts were similar to the monoacylglyceride lipase from Penicillium camembertii.
Keywords: Chlorinated glycerides; Dichloropropanol esters; Monoglyceride lipase

Lahsen Ababouch, Assuring fish safety and quality in international fish trade, Marine Pollution Bulletin, Volume 53, Issues 10-12, The Oceans and Human Health, 2006, Pages 561-568, ISSN 0025-326X, DOI: 10.1016/j.marpolbul.2006.08.011.
(http://www.sciencedirect.com/science/article/B6V6N-4M4TW00-1/2/fe6f9655a61633aeff520fe75ac4a569)
Abstract:
International trade in fishery commodities reached US$ 58.2 billion in 2002, a 5% improvement relative to 2000 and a 45% increase over 1992 levels. Within this global trade, developing countries registered a net trade surplus of US$ 17.4 billion in 2002 and accounted for almost 50% by value and 55% of fish exports by volume.
This globalization of fish trade, coupled with technological developments in food production, handling, processing and distribution, and the increasing awareness and demand of consumers for safe and high quality food have put food safety and quality assurance high in public awareness and a priority for many governments. Consequently, many countries have tightened food safety controls, imposing additional costs and requirements on imports. As early as 1980, there was an international drive towards adopting preventative HACCP-based safety and quality systems. More recently, there has been a growing awareness of the importance of an integrated, multidisciplinary approach to food safety and quality throughout the entire food chain. Implementation of this approach requires an enabling policy and regulatory environment at national and international levels with clearly defined rules and standards, establishment of appropriate food control systems

and programmes at national and local levels, and provision of appropriate training and capacity building.
This paper discusses the international framework for fish safety and quality, with particular emphasis on the United Nation's Food and Agricultural Organization's (FAO) strategy to promote international harmonization and capacity building.
Keywords: Safety; Quality; Fish; International trade; Seafood; FAO

Helen H. Jensen, Changes in seafood consumer preference patterns and associated changes in risk exposure, Marine Pollution Bulletin, Volume 53, Issues 10-12, The Oceans and Human Health, 2006, Pages 591-598, ISSN 0025-326X, DOI: 10.1016/j.marpolbul.2006.08.014.
(http://www.sciencedirect.com/science/article/B6V6N-4M4CSP4-1/2/d55c8da8f60448942757dbe76e12335a)
Abstract:
Consumers world-wide are driving changes in the agriculture and food sector. Rising consumer income, changing demographics and lifestyles, and shifting preferences due to new information about the links between diet and health all contribute to new demands for foods. At the same time, technological changes in production, processing and distribution, growth in large-scale retailing, and changes in product availability, as well as expansion of trade world wide, have contributed to a rapidly changing market for food products. Changes in seafood consumption reflect these changes. The changes in consumer consumption patterns, new technologies and trade in product offer both expanded markets as well as new challenges to consumer exposure to food-borne risks. The strict quality control requirements of retail brokers, growth of private labels, and development of value-protecting marketing channels have become increasingly important in food markets. This paper addresses major trends that affect seafood consumption and the market for seafood products and the implications of these changes for consumer risk exposure to food safety hazards. The current economic environment highlights similarities and differences between the developed and developing countries, as well as diversity worldwide in consumption of seafood. Within this context, four major trends affect consumer consumption of foods, including seafood and fish products today: rising income; changing demographics; changing markets for food; and an increasingly global market for food products. Changes in consumer risk exposure to food safety problems are addressed in the context of these trends.

M.A. Slingerland, K. Traore, A.P.P. Kayode, C.E.S. Mitchikpe, Fighting Fe deficiency malnutrition in West Africa: an interdisciplinary programme on a food chain approach, NJAS - Wageningen Journal of Life Sciences, Volume 53, Issues 3-4, 2006, Pages 253-279, ISSN 1573-5214, DOI: 10.1016/S1573-5214(06)80009-6.
(http://www.sciencedirect.com/science/article/B94T2-4WFBS5M-2/2/12a09166d5fdc731ca1dbfbdbb7d6ba5)
Abstract:
About 2 billion people, mainly women and young children, suffer from iron deficiency. The supply of iron (Fe) falls short when consumed foods have a low Fe content or when absorption of Fe is inhibited by the presence of phytic acid and polyphenols in the diet. Current interventions are dietary diversification, supplementation, fortification and biofortification. In West Africa these interventions have only moderate chances of success due to low purchasing power of households, lack of elementary logistics, lack of central processing of food and the high heterogeneity in production and consumption conditions. A staple food chain approach, integrating parts of current interventions was proposed as an alternative. The research was carried out in several villages in Benin and Burkina Faso to take ecological, cultural and socio-economic diversity into account. The interdisciplinary approach aimed at elaborating interventions in soil fertility management, improvement and choice of sorghum varieties and food processing, to increase Fe and decrease the phytic acid-Fe molar ratio in sorghum-based foods. The phytic acid-Fe molar ratio was used as

a proxy for Fe bioavailability in food. Synergy and trade-offs resulting from the integrated approach showed its added value. P fertilization and soil organic amendments applied to increase yield were found to also increase phytic acid content of the grain and thus to decrease its nutritional value. Amounts of Fe and phytic acid and their ratio in the grain differed among sorghum varieties, illustrating the presence of genetic variation for Fe bioavailability. The current local food preparation method for one of the main sorghum-based foods (dibou) in northern Benin did not include processing steps that remove or de-activate anti-nutritional factors reducing Fe bioavailability. The preliminary results suggest that a feasible chain solution consists of breeding for high Fe and moderate phytic acid contents and using soil organic amendments and P fertilization to increase yields but that this needs to be followed by improved food processing to remove phytic acid. Further research on timing of application of phosphate, Fe fertilizer and soil organic amendments is needed to improve phytic acid-Fe molar ratios in the grain. Research on the exact distribution of Fe, phosphate, phytic acid and tannins within the sorghum grain is needed to enable the development of more effective combinations of food processing methods aiming for more favourable phytic acid-Fe molar ratios in sorghum-based food.
Keywords: anaemia; bioavailability; nutritional quality; diet; processing; phytic acid; agronomic practices

S.A. Wilks, H. Michels, C.W. Keevil, The survival of Escherichia coli O157 on a range of metal surfaces, International Journal of Food Microbiology, Volume 105, Issue 3, 15 December 2005, Pages 445-454, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.04.021.
(http://www.sciencedirect.com/science/article/B6T7K-4HDG94K-2/2/44686ef7f99755f1b1495215976b6c05)
Abstract:
Escherichia coli O157:H7 is a serious pathogen causing haemorrhagic colitis. It has been responsible for several large-scale outbreaks in recent years. E. coli O157:H7 is able to survive in a range of environments, under various conditions. The risk of infection from contaminated surfaces is recognised, especially due to the low infectious dose required. In this study, a high concentration (107 cells) of E. coli O157 was placed onto different metals and survival time measured. Results showed E. coli O157 to survive for over 28 days at both refrigeration and room temperatures on stainless steel. Copper, in contrast, has strong antibacterial properties (no bacteria can be recovered after only 90 min exposure at 20 [degree sign]C, increasing to 270 min at 4 [degree sign]C) but its poor corrosion resistance and durability make it unsuitable for use as a surface material. Other copper-containing alloys, such as copper nickels and copper silvers, have improved durability and anticorrosion properties and greatly reduce bacterial survival times at these two temperatures (after 120 min at 20 [degree sign]C and 360 min at 4 [degree sign]C, no E. coli could be detected on a copper nickel with a 73% copper content). Use of a surface material with antibacterial properties could aid in preventing cross-contamination events in food processing and domestic environments, if standard hygiene measures fail.
Keywords: E. coli; Metal alloys; Survival; Surfaces; Cross-contamination

Maurizio Avella, Jan J. De Vlieger, Maria Emanuela Errico, Sabine Fischer, Paolo Vacca, Maria Grazia Volpe, Biodegradable starch/clay nanocomposite films for food packaging applications, Food Chemistry, Volume 93, Issue 3, December 2005, Pages 467-474, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.10.024.
(http://www.sciencedirect.com/science/article/B6T6R-4F14YV8-8/2/50b20f32732ae57907b9480318449b99)
Abstract:
Novel biodegradable starch/clay nanocomposite films, to be used as food packaging, were obtained by homogeneously dispersing montmorillonite nanoparticles in different starch-based materials via polymer melt processing techniques. Structural and mechanical characterizations on

the nanocomposite films were performed. The results show, in the case of starch/clay material, a good intercalation of the polymeric phase into clay interlayer galleries, together with an increase of mechanical parameters, such as modulus and tensile strength.
Finally the conformity of our samples with actual regulations and European directives on biodegradable materials was verified by migration tests and by putting the films into contact with vegetables and simulants.
Keywords: Nanocomposite; Biodegradable; Food contact; Migration tests; EU directives

Massimo F. Marcone, Characterization of the edible bird's nest the 'Caviar of the East', Food Research International, Volume 38, Issue 10, December 2005, Pages 1125-1134, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.02.008.
(http://www.sciencedirect.com/science/article/B6T6V-4GHRBYJ-1/2/e71763266719d6c6857cb604a814ac34)
Abstract:
A few species of swiflets (genus Aerodramus) build edible nests that are consumed by humans worldwide, as a delicacy known as the 'Caviar of the East' or as a medicinal food. This study reports on the compositional properties of two types of nest, the white nest and the red 'blood' nest. The order of composition (from lowest to highest) was found to be identical for both types of nests, i.e., lipid (0.14-1.28%), ash (2.1%), carbohydrate (25.62-27.26%) and protein (62-63%). It was also found that both nests share a common 77 KDa protein that has properties similar to those of the ovotransferrin protein in eggs. This protein may be partially responsible for the severe allergic reactions that sometimes occur among young children who consume edible bird's nest products. It was found that SDS-PAGE electrophoretic fingerprinting might serve as a useful analytical technique for differentiating between white and red nests and for determining if the more expensive 'blood' nest was adulterated with the less expensive white nest. Also evaluated were different analytical methodologies for detecting adulterants. Three of the most common adulterants found in retail bird's nests are karaya gum, red seaweed, and tremella fungus, and they are routinely incorporated during commercial processing prior to final sale. Using crude protein determination, it was found that these adulterants (which typically accounted for 2-10% of the finished nest), reduce the overall crude protein content of the genuine white bird's nest by as much as 1.1-6.2%. A modified xanthoproteic nitric acid test for proteins proved to be a rapid, and simple test to detect adulteration in both whole and finely ground nests, and would be suitable in the field where analytical facilities are not readily available.
After simple nitric acid treatment, visual examination and comparison of whole nests adulterated with karaya gum, red seaweed, and Tremella fungus against the authentic white nest revealed that levels of adulteration as low as 1.7%, 1.8%, and 3.5%, respectively, could be identified visually. In the case of finely ground nests, the visual detection level was higher for all three adulterants: 1.1% for karaya gum, 1.2% for red seaweed, and 2.0% for Tremella fungus. The use of a reflectance colourmeter rendered this test even more sensitive, allowing detection at even lower levels.

T. Miri, M. Barigou, P.J. Fryer, P.W. Cox, Flow induced fibre alignment in Mycoprotein paste, Food Research International, Volume 38, Issue 10, December 2005, Pages 1151-1160, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.04.005.
(http://www.sciencedirect.com/science/article/B6T6V-4G9Y4H4-3/2/b8901c79584bc1252138fa7ab4f84cde)
Abstract:
The effects of extrusion and squeeze flow processing on the microstructure of Mycoprotein filamentous paste, a novel meat product alternative, are investigated. The flow induced effects are quantified in terms of fibre orientation measured by a technique of fluorescence microscopy and image analysis. Imaging of the original mycelia fibre paste showed that its microstructure is `isotropic'. Squeezing of the native paste does not result in any significant fibre rearrangement.

This is attributed to the high fibre concentration and, thus, high level of fibre entanglement in the squeezed film, and slip at the wall. A semi-concentrated suspension of mycelia fibres in a golden syrup matrix, however, shows considerable structural rearrangement throughout. Extrusion of the native paste leads to a high degree of fibre alignment in the direction of flow with a high proportion of the fibre population (~80-90%) being realigned. An Exponential-Uniform Mix distribution was successfully used to describe fibre orientation in both extrusion and squeeze flow. The results show the strong link between the microstructure of highly structured food products and the mode of processing used. They may also have important implications for the rheological testing of such structurally complex materials, as the rheological response of the material may well dependent on the way it is made to interact with the instrument.
Keywords: Food; Image analysis; Meat alternative; Microstructure; Mycoprotein; Rheology

Molly Damon, Nancy Z. Zhang, David B. Haytowitz, Sarah L. Booth, Phylloquinone (vitamin K1) content of vegetables, Journal of Food Composition and Analysis, Volume 18, Issue 8, December 2005, Pages 751-758, ISSN 0889-1575, DOI: 10.1016/j.jfca.2004.07.004.
(http://www.sciencedirect.com/science/article/B6WJH-4FFX96B-4/2/b28e18782dd4facf2a615196ba956415)
Abstract:
Assessment of vitamin K (VK) dietary intakes has been limited by incomplete VK food composition data for the US food supply. The phylloquinone (VK-1 or vitamin K1) concentrations of a variety of geographically representative vegetables (n=218) were determined by reversed-phase high performance liquid chromatography with fluorescent detection. Green leafy and flower vegetables including broccoli, broccoli raab, spinach, and certain lettuces, contained >100 [mu]g phylloquinone/100 g vegetable. In contrast, raw tubers and roots contained <10 [mu]g phylloquinone/100 g vegetable. Iceberg lettuce, a primary dietary source of phylloquinone, contained 24.1 [mu]g phylloquinone/100 g vegetable, which is less than previously listed in nutrient databases. Potential factors affecting phylloquinone concentrations include processing and varietal type of leafy vegetables.
Keywords: Phylloquinone; Vegetables; HPLC; Vitamin K

Cristiane H. de Azevedo-Meleiro, Delia B. Rodriguez-Amaya, Carotenoids of endive and New Zealand spinach as affected by maturity, season and minimal processing, Journal of Food Composition and Analysis, Volume 18, Issue 8, December 2005, Pages 845-855, ISSN 0889-1575, DOI: 10.1016/j.jfca.2004.10.006.
(http://www.sciencedirect.com/science/article/B6WJH-4G65NH2-5/2/e2ff07a8a733faa26980866eab335ff2)
Abstract:
It is increasingly recognized that the nutrient/phytochemical composition in foods can be optimized through agriculture and food technology. To put this strategy into practice, the compositional variation throughout the food chain has to be known. Additionally, natural variation in carotenoid composition must be distinguished from analytical variability. In endive, as well as lettuce, the carotenoid concentrations of the mature leaves were two to four times greater than those of the young leaves. In contrast, the younger leaves of New Zealand spinach had slightly higher carotenoid levels than the mature leaves. The carotenoid contents of marketed minimally processed endive and New Zealand spinach were significantly higher in the summer than in the winter, reflecting seasonal rather than processing effects. [beta]-Carotene, lutein, violaxanthin, and neoxanthin were reduced 18%, 19%,12% and 8%, respectively, in minimally processed endive during 5 days of storage at 7-9 [degree sign]C. The corresponding losses in New Zealand spinach were 42%, 32%, 20% and 20%.
Keywords: Carotenoids; Endive; New Zealand spinach; Maturity; Seasonal effects; Minimal processing

Vittorio Raffaele Romano, Francesco Marra, Umberto Tammaro, Modelling of microwave heating of foodstuff: study on the influence of sample dimensions with a FEM approach, Journal of Food Engineering, Volume 71, Issue 3, Special Section on Finite Element Modelling of Foods, December 2005, Pages 233-241, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.11.036.
(http://www.sciencedirect.com/science/article/B6T8J-4F6F682-2/2/bbefc5abaf94e3063bd0fbe9bcab2440)
Abstract:
The microwave heating has been modelled by many authors, often using commercial software based on finite element method. Two different approaches have been followed to evaluate the effects of the electromagnetic field distribution: solving the Maxwell's equations and applying the Lambert's law.
In this paper we analyse the effect of dimensions microwave heating of cylindrical samples, developing a numerical model solved by a commercial package, FEMLAB, to simulate heat transfer in foodstuff, applying the Lambert's law, as microwave absorption relationship correctly formulated for cylindrical geometry.
Keywords: Microwave heating; Food processing; FEM

A. Perez-Galvez, M. Jaren-Galan, M.I. Minguez-Mosquera, Impact of the increased thermal processing on retinol equivalent values of paprika oleoresins, Journal of Food Engineering, Volume 71, Issue 4, December 2005, Pages 379-385, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.10.042.
(http://www.sciencedirect.com/science/article/B6T8J-4F02M1Y-C/2/fdb0d2d0495985ca4274d6aa6fc43d2c)
Abstract:
Processing of pepper fruits (Capsicum annuum L.) to produce their oleoresins includes an extraction stage with organic solvent that extract the lipophilic content of raw material, and a desolventizing step that removes the organic solvent employed initially. This process subjects components of the product to a heating stress, what may generates degradation of the carotenoid fraction that provides this product its colouring capacity, and nutritional content. Food legislation tends to limit the use of organic solvents and diminish the residue limit levels allowed in the end product. Different paprika oleoresins were subjected to thermal degradation and evolution of the provitamin A carotenoids, [beta]-carotene and [beta]-cryptoxanthin was followed. Two reaction pathways were detected during thermal process: isomerization and degradation with different contributions to the provitamin A value of the sample. Increasing values of temperature applied to oleoresins (conditions that may be necessary to obtain an end-product with lower residue solvent levels) show that stability of carotenoids in paprika oleoresins, is good enough to suffer a prolonged heating process avoiding changes in the RE values.
Keywords: Carotenoids; Processing of paprika oleoresins; Provitamin A; Retinol equivalent; Temperature-time regime; Isomerization reactions

O.D. Teniola, P.A. Addo, I.M. Brost, P. Farber, K.-D. Jany, J.F. Alberts, W.H. van Zyl, P.S. Steyn, W.H. Holzapfel, Degradation of aflatoxin B1 by cell-free extracts of Rhodococcus erythropolis and Mycobacterium fluoranthenivorans sp. nov. DSM44556T, International Journal of Food Microbiology, Volume 105, Issue 2, 25 November 2005, Pages 111-117, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.05.004.
(http://www.sciencedirect.com/science/article/B6T7K-4GSJPX5-1/2/f05c862068c6b05ac738e9c28fb5cdf1)
Abstract:
Biological degradation of aflatoxin B1 (AFB1) by Rhodococcus erythropolis was examined in liquid cultures and in cell-free extracts. Dramatic reduction of AFB1 was observed during incubation in

the presence of R. erythropolis cells (17% residual AFB1 after 48 h and only 3-6% residual AFB1 after 72 h). Cell-free extracts of four bacterial strains, R. erythropolis DSM 14303, Nocardia corynebacterioides DSM 12676, N. corynebacterioides DSM 20151, and Mycobacterium fluoranthenivorans sp. nov. DSM 44556T were produced by disrupting cells in a French pressure cell. The ability of crude cell-free extracts to degrade AFB1 was studied under different incubation conditions. Aflatoxin B1 was effectively degraded by cell free extracts of all four bacterial strains. N. corynebacterioides DSM 12676 (formerly erroneously classified as Flavobacterium aurantiacum) showed the lowest degradation ability (60%) after 24 h, while >90% degradation was observed with N. corynebacterioides DSM 20151 over the same time. R. erythropolis and M. fluoranthenivorans sp. nov. DSM 44556T have shown more than 90% degradation of AFB1 within 4 h at 30 [degree sign]C, whilst after 8 h AFB1 was practicably not detectable. The high degradation rate and wide temperature range for degradation by R. erythropolis DSM 14303 and M. fluoranthenivorans sp. nov. DSM 44556T indicate potential for application in food and feed processing.
Keywords: Aflatoxin B1; AFB1, degradation; Rhodococcus erythropolis; Mycobacterium fluoranthenivorans sp. nov.

Jaime Martinez-Urtaza, Ernesto Liebana, Use of pulsed-field gel electrophoresis to characterize the genetic diversity and clonal persistence of Salmonella senftenberg in mussel processing facilities, International Journal of Food Microbiology, Volume 105, Issue 2, 25 November 2005, Pages 153-163, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.04.006.
(http://www.sciencedirect.com/science/article/B6T7K-4GX0C0J-2/2/9e5e8216ae48a8fc0a095b7def92cb43)
Abstract:
Salmonella senftenberg was detected in association with persistent contamination events in mussel processing facilities between 1998 and 2002 in Spain. A total of 110 isolates from 8 facilities were subjected to molecular typing by Pulsed-Field Gel Electrophoresis (PFGE). Additionally, a selection of epidemiologically unrelated isolates of this serovar originating from human, animal, feed and environmental sources was included in the study. PFGE analysis proved to be a useful tool for studying the persistence and dissemination of S. senftenberg in factory environments. Facilities that used brine in their processing lines had greater genetic diversity among their S. senftenberg populations, which supports the hypothesis that imported salt used for brine preparation could have been the origin of the contamination. The XbaI type X19 was the most prevalent among the panel, and it was found persisting exclusively in one facility during the 5-year study. In general, isolates from mussel processing plants were clearly different from those of clinical and environmental sources. However, one of the human isolates showed an indistinguishable restriction pattern to an isolate from a frozen mussel sample, this could indicate the potential for food-borne transmission of this serovar via consumption of contaminated seafood products. Isolates in the study were largely sensitive to antimicrobials. Only 9 isolates (6 from mussel processing facilities, 1 from soy flour and 2 from meat meal) showed antimicrobial resistance.
Keywords: Salmonella senftenberg; PFGE; Mollusc contamination; Antibiotic resistance; Food safety

John Sumner, Tom Ross, Ian Jenson, Andrew Pointon, A risk microbiological profile of the Australian red meat industry: Risk ratings of hazard-product pairings, International Journal of Food Microbiology, Volume 105, Issue 2, 25 November 2005, Pages 221-232, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.03.016.
(http://www.sciencedirect.com/science/article/B6T7K-4GVGT95-1/2/3a3e80c0853e7635b1399e51e6613f9e)
Abstract:

A risk profile of microbial hazards across the supply continuum for the beef, sheep and goat meat industries was developed using both a qualitative tool and a semi-quantitative, spreadsheet tool, Risk Ranger. The latter is useful for highlighting factors contributing to food safety risk and for ranking the risk of various product/pathogen combinations. In the present profile the qualitative tool was used as a preliminary screen for a wide range of hazard-product pairings while Risk Ranger was used to rank in order of population health risk pairings for which quantitative data were available and for assessing the effect of hypothetical scenarios. `High' risk hazard-product pairings identified were meals contaminated with Clostridium perfringens provided by caterers which have not implemented HACCP; kebabs cross-contaminated by Salmonella present in drip trays or served undercooked; meals served in the home cross-contaminated with Salmonella. `Medium' risk hazard-product pairings identified were ready-to-eat meats contaminated with Listeria monocytogenes and which have extended shelf life; Uncooked Comminuted Fermented Meat (UCFM)/Salami contaminated with Enterohaemorrhagic E. coli (EHEC) and Salmonella; undercooked hamburgers contaminated with EHEC; kebabs contaminated by Salmonella under normal production or following final 'flash' heating. Identified `low' risk hazard-product pairings included cooked, ready-to-eat sausages contaminated with Salmonella; UCFM/Salami contaminated with L. monocytogenes; well-cooked hamburgers contaminated with EHEC. The risk profile provides information of value to Australia's risk managers in the regulatory, processing and R&D sectors of the meat and meat processing industry for the purposes of identifying food safety risks in the industry and for prioritising risk management actions.
Keywords: Meat industry; Risk profile; Qualitative and semi-quantitative risk ratings; 'What-if' scenarios

Chun-Chieh Yang, Kuanglin Chao, Yud-Ren Chen, Howard L. Early, Systemically diseased chicken identification using multispectral images and region of interest analysis, Computers and Electronics in Agriculture, Volume 49, Issue 2, November 2005, Pages 255-271, ISSN 0168-1699, DOI: 10.1016/j.compag.2005.05.002.
(http://www.sciencedirect.com/science/article/B6T5M-4GP1V73-1/2/1cf367f728410ed05f1fd81dd93c6e2b)
Abstract:
A simple image differentiation method for the identification of systemically diseased chickens was developed and cross-system validated using two different multispectral imaging systems. The first system acquired images at three wavelengths, 460 nm, 540 nm, and 700 nm, for a batch of 164 wholesome and 176 systemically diseased chicken carcasses. The second system acquired images at four wavelengths, 488 nm, 540 nm, 580 nm, and 610 nm, for a second batch of 332 wholesome and 318 systemically diseased chicken carcasses. Image masking was performed using the wavelengths of 700 nm and 610 nm for the first and second imaging systems, respectively. The relative reflectance intensity at individual wavelengths, ratio of intensities between pairs of wavelengths, and intensity combinations based on principal component analysis (PCA) were analyzed. It was found that the wavelengths of 540 nm and 580 nm are vital for successful chicken image differentiation. With proper wavelength selection, PCA can be useful for multispectral image analysis. The wavelength of 540 nm, selected as the key wavelength, was used in both imaging systems for image differentiation. An image processing algorithm was developed to define and locate the region of interest (ROI) as the differentiation area on the image. Based on ROI analysis, a single threshold was generated for image differentiation. The average relative reflectance intensity of the ROI was calculated for each chicken image. The classification and regression trees (CART) decision tree algorithm was used to determine the threshold value to differentiate systemically diseased chickens from wholesome ones. The first differentiation threshold, based on the first image batch and generated by the decision tree method, was applied to the second image batch for cross-system validation, and vice versa. The accuracy from validation was 95.7% for wholesome and 97.7% of systemically diseased chickens for the first

image batch, and 99.7% for wholesome and 93.5% for systemically diseased chickens for the second image batch. The threshold values, each generated using only one of the two image batches, were similar. The results showed that using a single key wavelength and a threshold, this simple image processing and differentiation method could be used in automated on-line applications for chicken inspection.
Keywords: Food safety; Image analysis; Multispectral imagery; Poultry; Septicemia

M. van Schothorst, A proposed framework for the use of FSOs, Food Control, Volume 16, Issue 9, Impact of Food Safety Objectives on Microbiological Food Safety Management. Proceedings if a workshop held on 9-11 April 2003 Marseille, France, November 2005, Pages 811-816, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.10.021.
(http://www.sciencedirect.com/science/article/B6T6S-4F53N5M-3/2/97ed09151843e03bfebca59f01360e3b)
Abstract:
This article is based on a background paper prepared for the ILSI Europe workshop on 'The impact of Food Safety Objectives on Microbiological Food Safety Management'. It describes the how the concept of 'Food Safety Objectives' (FSOs) can be used to target HACCP plans. FSOs describe the level of a hazard at the moment of consumption, they are considered to be 'acceptable levels' of pathogens. Control measures applied from farm to fork must assure that such levels are not exceeded. In order to achieve such levels, Performance Criteria (PCs) are set to assure that a certain killing effect of a process or treatment is achieved or that a potential increase in numbers does not result in unacceptable levels of pathogens in a product. For reasons explained in this article, the term Performance Objective (PO) is introduced to designate levels of pathogens at stages in the food chain before the moment of consumption. In order to meet PCs, POs or FSOs, process criteria (such as time and temperature) and product criteria (such as pH and aw) need to be specified in the HACCP plans or in other documents. FSOs and POs are food safety targets and differ as such from Microbiological Criteria which are designed to accept or reject foods based on test results. Examples are given to illustrate that, although some of the terms may be new to certain sectors in the food chain, the concepts have been applied for many years in food processing.
Keywords: Food safety management; Food safety objectives; Performance objectives; Performance criteria

Utai Klinkesorn, Pairat Sophanodora, Pavinee Chinachoti, Eric A. Decker, D. Julian McClements, Encapsulation of emulsified tuna oil in two-layered interfacial membranes prepared using electrostatic layer-by-layer deposition, Food Hydrocolloids, Volume 19, Issue 6, November 2005, Pages 1044-1053, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2005.01.006.
(http://www.sciencedirect.com/science/article/B6VP9-4FT3KMR-1/2/c0fbd3953ce0831acf3749555582e4db)
Abstract:
Tuna oil-in-water emulsions (5 wt% tuna oil, 100 mM acetate buffer, pH 3.0) containing droplets stabilized either by lecithin membranes (primary emulsions) or by lecithin-chitosan membranes (secondary emulsions) were produced. The secondary emulsions were prepared using a layer-by-layer electrostatic deposition method that involved adsorbing cationic chitosan onto the surface of anionic lecithin-stabilized droplets. Primary and secondary emulsions were prepared in the absence and presence of corn syrup solids (a carbohydrate widely used in the micro-encapsulation of oils) and then their stability to environmental stresses was monitored. The secondary emulsions had better stability to droplet aggregation than primary emulsions exposed to thermal processing (30-90 [degree sign]C for 30 min), freeze-thaw cycling (-18 [degree sign]C for 22 h/30 [degree sign]C for 2 h), high sodium chloride contents (200 mM NaCl) and freeze-drying. The addition of corn syrup solids decreased the stability of primary emulsions, but increased the

stability of secondary emulsions. The interfacial engineering technology used in this study could lead to the creation of food emulsions with novel properties or improved stability to environmental stresses.
Keywords: Tuna oil; Emulsion; Chitosan; Lecithin; Corn syrup solids; Stability

M. Handschur, G. Pinar, B. Gallist, W. Lubitz, A.G. Haslberger, Culture free DGGE and cloning based monitoring of changes in bacterial communities of salad due to processing, Food and Chemical Toxicology, Volume 43, Issue 11, November 2005, Pages 1595-1605, ISSN 0278-6915, DOI: 10.1016/j.fct.2005.05.009.
(http://www.sciencedirect.com/science/article/B6T6P-4GHSGV4-1/2/17b94954ccf4abb9a5ea3e5a63ecaf1e)
Abstract:
To assess the possibilities of a culture-independent monitoring of bacterial communities in the food chain, samples of salad from farming sites as well as corresponding, processed products in stores were analysed. The bacterial DNA was extracted using a modified soil extraction protocol. Amplification of 16S rDNA was carried out using primers specific for eubacteria and enterobacteriaceae. Fingerprints of 200/370 bp respectively were obtained by denaturing gradient gel electrophoresis (DGGE) analysis following PCR and nested PCR amplification. In parallel to DGGE analysis, clone libraries containing PCR fragments of the ribosomal gene were constructed and clones were screened by DGGE. DGGE analysis indicated a high diversity of bacterial communities in salad samples. Fingerprints indicated clearly reduced diversity of bacterial communities in processed samples from markets compared to field-grown salads.
Surprisingly, primers pointed out in literature as specific for enterobacteriaceae did amplify pseudomonadeceae as well. Therefore, the more specific primers fD2 and rP1 were used subsequently in this study to amplify specific members of the family enterobacteriaceae.
A total of 11 different 16S rDNA sequences were obtained and subjected to sequencing and phylogenetic affiliation.
Sequences derived from the eubacterial clone library from organically farmed salad were affiliated to the family microbacteriaceae and pseudomonadaceae. In addition, a potential new genus within the family of enterobacteriaceae was detected. Furthermore, a sequence showing 98.9% similarity to Pseudomonas libaniensis (fluorescence subgroup) was found in a processed salad sample but not in the corresponding field samples. This species is generally known as an opportunistic pathogen.
Whereas molecular based monitoring of bacterial communities in food still may need more experience and standardisation to detect specific bacteria present, the monitoring strategy presented in this paper, combining DGGE analysis with the construction of clone libraries, is an attractive method for culture-independent monitoring of changes of bacterial communities in the food chain.
Keywords: Bacterial communities; Salad; Denaturing gradient gel electrophoresis (DGGE); Culture free; Monitoring; Enterobacteriaceae; Pseudomonadaceae

Loic Perring, Daniel Andrey, Marija Basic-Dvorzak, Daniel Hammer, Rapid quantification of iron, copper and zinc in food premixes using energy dispersive X-ray fluorescence, Journal of Food Composition and Analysis, Volume 18, Issue 7, November 2005, Pages 655-663, ISSN 0889-1575, DOI: 10.1016/j.jfca.2004.06.011.
(http://www.sciencedirect.com/science/article/B6WJH-4FFN4RJ-6/2/941f1f0ec75ee76b7f8467ffff428d6f)
Abstract:
A simple and rapid method for the determination of iron, copper and zinc in food premixes (used during human food processing) by energy dispersive X-ray fluorescence (XRF) has been established and validated using 25 samples. Reference values were obtained by inductively

coupled plasma-optical emission spectroscopy after microwave acidic digestions. Studied samples presenting wide ranges of concentrations: Fe=500-35000 mg/kg, Cu=50-4000 mg/kg and Zn=700-32000 mg/kg were quantified in 200 s by XRF measurements using a rhodium tube.
Keywords: EDXRF; ICP-AES; Iron; Copper; Zinc; Premixes; Alternative; Reference; Quantitative analysis; Rapids; Minerals

P.G. Prabhakara Rao, T. Jyothirmayi, K. Balaswamy, A. Satyanarayana, D.G. Rao, Effect of processing conditions on the stability of annatto (Bixa orellana L.) dye incorporated into some foods, LWT - Food Science and Technology, Volume 38, Issue 7, November 2005, Pages 779-784, ISSN 0023-6438, DOI: 10.1016/j.lwt.2004.08.015.
(http://www.sciencedirect.com/science/article/B6WMV-4DVBGR1-6/2/26a572c34479e66c65185bf2b08a75d6)
Abstract:
Annatto dye is an orange-yellow pigment extensively used in dairy products. Studies were carried out to determine the stability of bixin (oil-soluble dye) during different treatments and processing in traditional foods of India. The annatto dye was exposed to heat treatments in a baking oven at 100, 150 and 180 [degree sign]C for time periods up to 60 min; deep fat heating at 160, 180 and 200 [degree sign]C for periods ranging from 30 to 120 s; microwave oven at 300 and 700 W for periods ranging from 15 to 60 s; and in a pressure cooker for a 15-min period. The losses in bixin concentration during these experiments were compared with the losses of bixin in the preparation of products like cakes, chegodis, biscuits and fried rice. The mass fractions of bixin lost were maximum when the dye was exposed directly to heating in a baking oven (0.54) and in deep fat heating (0.47). The mass fraction of bixin lost was 0.30 in cakes and negligible losses were observed in biscuits (0.015). In case of the deep fat fried snack, the dye leached in to the oil, which resulted in maximum loss (0.65). Microwaves did not affect the bixin in the dye when exposed directly or in the products. Pressure cooking resulted in mass fractions of bixin lost (0.25-0.33) comparable to those of other products.
Keywords: Annatto dye; Bixin; Stability; Traditional foods; Processing; Storage

J.A. Gerrard, K.H. Sutton, Addition of transglutaminase to cereal products may generate the epitope responsible for coeliac disease, Trends in Food Science & Technology, Volume 16, Issue 11, November 2005, Pages 510-512, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.07.002.
(http://www.sciencedirect.com/science/article/B6VHY-4GWBDVC-3/2/9a3632b0dfcc9612da7f15d4801756a2)
Abstract:
Transglutaminase is a crosslinking enzyme that is being used more extensively in foods and has been widely accepted as a processing aid. We, and others, have reported the use of transglutaminase in the baking industry to improve the functional properties of bread, pastry and croissant dough. Early work suggested that transglutaminase may reduce the allergenicity of wheat flour. However, recent research into the molecular mechanism of coeliac disease suggests the disturbing possibility that transglutaminase in baked products may act upon gliadin proteins in dough to generate the epitope associated with the coeliac response. Further work is urgently required to assess this possibility. In the meantime, we do not recommend the use of transglutaminase in baked products.

Radhika K. Apaiah, Eligius M.T. Hendrix, Design of a supply chain network for pea-based novel protein foods, Journal of Food Engineering, Volume 70, Issue 3, Operational Research and Food Logistics, October 2005, Pages 383-391, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.02.043.
(http://www.sciencedirect.com/science/article/B6T8J-4DW8XKH-1/2/6eca2c3c0b46ff0b0496346d0f8ff3ba)
Abstract:

This paper presents an operations research technique that can be used for supply chain design and applies it to create a supply network with a goal to manufacture a pea-based NPF as cheaply as possible. The current food production and consumption pattern has a strong impact on the environment and resources and is not sustainable. Meat production in particular is not appealing from an environmental point of view, because of the inefficient conversion of protein in the feed into protein in the slaughtered animal. Novel protein foods (NPFs) are non-meat protein ingredients that are designed to replace meat-based ingredients in meals. The non-meat protein products presently available do not meet the expectations of most consumers and cannot be considered as realistic alternatives to meat (http://www.profetas.nl). They are niche products and are expensive when compared to pork. The prospects for replacing meat-derived ingredients by NPFs are more promising. The partial shift from an animal based diet to a plant, specifically pea-based diet may be feasible only if the price of these products decreases.
A supply chain for NPFs can be divided into three major links: primary production (growing and harvesting), ingredient preparation (milling and concentration of pea protein) and product processing (manufacture of the NPF). The pea-based product is designed for the Dutch market. The peas are sourced from several locations around the world such as Canada, Ukraine, France and the Netherlands and are transported by sea, rail, road or barge. This paper presents a study on the optimisation of the supply network for NPFs in the Netherlands using linear programming. It focuses on finding the lowest cost at which NPFs can be manufactured for a specific market demand; while deciding the location of primary production, ingredient processing and product production areas and modes of transportation by minimising the sum of production and transportation costs.
Keywords: Novel protein foods; Supply chains; Optimisation

A.J. Borderias, I. Sanchez-Alonso, M. Perez-Mateos, New applications of fibres in foods: Addition to fishery products, Trends in Food Science & Technology, Volume 16, Issue 10, October 2005, Pages 458-465, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.03.011.
(http://www.sciencedirect.com/science/article/B6VHY-4G65V4W-1/2/8613b0906712ec3cd88afeefa0c75256)
Abstract:
Seafoods possess high nutritional value and moreover offer functional properties. However, fish products do not contain fibre. Fibre is an essential compound in the diet, which has health benefit effects in certain disorders. At the same time, dietary fibres can be an effective tool in seafood processing for improving functional properties such as water binding, gelling, etc. This paper offers a general view of the role of dietary fibres in a food system and discusses the technological and functional roles of different types of fibres of vegetable origin (cereal, fruits) and animal origin (chitosan), with different characteristics, when they are used as ingredients in the development of restructured fish products.

Joshua B. Gurtler, Jeffrey L. Kornacki, Larry R. Beuchat, Enterobacter sakazakii: A coliform of increased concern to infant health, International Journal of Food Microbiology, Volume 104, Issue 1, 25 September 2005, Pages 1-34, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.02.013.
(http://www.sciencedirect.com/science/article/B6T7K-4GP1V70-2/2/0efd3d11ffa702118f6f9aa686dea0e5)
Abstract:
The first cases of neonatal meningitis believed to have been caused by Enterobacter sakazakii were reported in 1961. Prompted by several subsequent outbreaks of E. sakazakii infections in neonates and an increasing number of neonates in intensive care units being fed rehydrated powdered infant formula, considered to be a source of the pathogen, public health authorities and researchers are exploring ways to eliminate the bacterium or control its growth in dry infant formula, processing environments and formula preparation areas in hospitals. Reviewed here are

advances in taxonomy and classification of E. sakazakii, methods of detecting, isolating and typing the bacterium, antibiotic resistance, clinical etiology and pathogenicity. Outbreaks of E. sakazakii infections in neonates and adults are summarized. Reports on the presence of E. sakazakii in clinical settings, the environment and foods and food processing facilities are reviewed. Tolerance of the pathogen to environmental stresses, its behavior in powdered and rehydrated infant formulae and hazard analysis and risk management are discussed. Research needs are presented.
Keywords: Enterobacter sakazakii; Infant formula; Neonate; Meningitis

Tereza C.R.M. Oliveira, Shai Barbut, Mansel W. Griffiths, Detection of Campylobacter jejuni in naturally contaminated chicken skin by melting peak analysis of amplicons in real-time PCR, International Journal of Food Microbiology, Volume 104, Issue 1, 25 September 2005, Pages 105-111, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.02.008.
(http://www.sciencedirect.com/science/article/B6T7K-4GJK82W-1/2/b516f2fb9f8efd9730f5c640eefd4dea)
Abstract:
Contamination of poultry by Campylobacter spp. is a significant source of human diarrheal diseases. Traditional methods currently used to detect Campylobacter in foods are time-consuming and labor-intensive. In this study, primers designed for the Campylobacter jejuni cadF gene sequence were used in a SYBR Green I real-time PCR assay as an alternative to a conventional bacteriological method for the rapid detection of C. jejuni from poultry. Twelve portions of chicken purchased from two local grocery stores and 39 portions obtained from a commercial processing plant were examined. Samples of the skin were enriched in Bolton broth at 37 [degree sign]C for 3 h and then at 42 [degree sign]C for 9, 21, or 45 h under microaerobic conditions. DNA was extracted from 1-ml aliquots of the enrichment cultures using 1% Triton X-100. The DNA was used as the template in a real-time polymerase chain reaction (PCR) assay. After 24 h of enrichment, C. jejuni was isolated from 13 samples and all of the positive cultures were also detected by the real-time PCR procedure. C. jejuni was detected by both methods from samples artificially contaminated with 1 or 10 CFU of C. jejuni per 10 g, after 24 h of enrichment. The real-time PCR method was found to be sensitive and specific. It significantly reduced the time required for the detection of C. jejuni in poultry following enrichment of samples.
Keywords: Campylobacter; Real-time PCR; Chicken meat

John F. Kennedy, Parmjit S. Panesar, P. Richardson, Editor, Improving the Thermal Processing of Foods, Woodhead Publishing Ltd, Cambridge, CB1 6AH, UK (2004) (xiii+507 pp., [pound sign]150.00, ISBN 1-85573-730-2)., Carbohydrate Polymers, Volume 61, Issue 4, 21 September 2005, Page 485, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2005.04.015.
(http://www.sciencedirect.com/science/article/B6TFD-4GMJ95W-1/2/3f14e43466c96445a579a3bae356f631)

David G. Pyburn, H. Ray Gamble, Elizabeth A. Wagstrom, Lowell A. Anderson, Lawrence E. Miller, Trichinae certification in the United States pork industry, Veterinary Parasitology, Volume 132, Issues 1-2, Trichinellosis - Proceedings of the 11th International Conference on Trichinellosis, 5 September 2005, Pages 179-183, ISSN 0304-4017, DOI: 10.1016/j.vetpar.2005.05.051.
(http://www.sciencedirect.com/science/article/B6TD7-4GHBPPP-4/2/83eb147830023ce8f1faae6e94f6c66e)
Abstract:
Control of Trichinella infection in U.S. pork has traditionally been accomplished by inspection of individual carcasses at slaughter or by post-slaughter processing to inactivate parasites. We propose that an alternative to individual carcass testing or processing can be used when pigs are raised in production systems where risk of exposure to Trichinella spiralis has been mitigated.

Declines in prevalence of this parasite in U.S. domestic swine during the last 30 years, coupled with improvements in pork production systems, now allow Trichinella control to be shifted to the farm through implementation of specific pork production practices. Knowledge of risk factors for exposure of swine to T. spiralis was used to develop an objective audit of risk that can be applied to pork production sites. In a pilot study, 461 production site audits were performed by trained veterinary practitioners. The on-farm audit included aspects of farm management, bio-security, feed and feed storage, rodent control programs and general hygiene. Of the 461 production site audits, 450 audits (97.6%) indicated compliance with the required good production practices. These sites are eligible for certification under the U.S. Trichinae Certification Program and will be audited regularly to maintain that status. The described trichinae certification mechanism will establish a process for ensuring the Trichinella safety of swine, and ultimately food products derived from swine, at the production level.
Keywords: Food safety; Trichinae; Pork; Trichinellosis; Pre-harvest pork safety; On-farm certification program

Donald M. Anderson, David M. Kulis, Bruce A. Keafer, Kristin E. Gribble, Roman Marin, Christopher A. Scholin, Identification and enumeration of Alexandrium spp. from the Gulf of Maine using molecular probes, Deep Sea Research Part II: Topical Studies in Oceanography, Volume 52, Issues 19-21, The Ecology and Oceanography of Toxic Alexandrium fundyense Blooms in the Gulf of Maine, September-October 2005, Pages 2467-2490, ISSN 0967-0645, DOI: 10.1016/j.dsr2.2005.06.015.
(http://www.sciencedirect.com/science/article/B6VGC-4HG69KF-1/2/853f078dc1d75b49ece5ea5f9a5ae09c)
Abstract:
Three different molecular methods were used with traditional brightfield microscope techniques to enumerate the toxic dinoflagellate Alexandrium fundyense in samples collected in the Gulf of Maine in 1998, 2000, 2001, and 2003. Two molecular probes were used in fluorescent whole-cell (WC) microscopic assays: a large-subunit ribosomal RNA (LSU rRNA) oligonucleotide probe (NA1) and a monoclonal antibody probe thought to be specific for Alexandrium spp. within the tamarense/catenella/fundyense complex. Cell abundance estimates also were obtained using the NA1 oligonucleotide probe in a semi-quantitative sandwich hybridization assay (SHA) that quantified target rRNA in cell lysates. Here we compare and contrast the specificity and utility of these probe types and assay approaches.
WC counts of the 1998 field samples demonstrated that A. fundyense cell densities estimated using the antibody approach were higher than those using either the NA1 oligonucleotide or brightfield microscopy due to the co-occurrence of A. ostenfeldii with A. fundyense, and the inability of the antibody to discriminate between these two species. An approach using cell size and the presence or absence of food vacuoles allowed more accurate immunofluorescent cell counts of both species, but small cells of A. ostenfeldii that did not contain food vacuoles were still mistakenly counted as A. fundyense. For 2001, a dual-labeling procedure using two oligonucleotide probes was used to separately enumerate A. ostenfeldii and A. fundyense in the WC format. In addition, the SHA was used in 2001 and 2003 to enumerate A. fundyense. Some agreement was observed between the two oligonucleotide methods, but there were differences as well. Not including samples with cell numbers below empirically determined detection limits of 25 cells l-1, good correlation was observed for surface samples and vertical profiles in May 2001 and June 2003 when the SHA estimates were, on average, equivalent, and 1.5x the WC counts, respectively. The worst correlations were for virtually all samples from the June 2001 cruise where the SHA both over- and under-estimated the WC counts. Some differences were expected, since the SHA and the WC assays measure different, but related parameters. The former quantifies intact cells and particulate material that might contain non-viable cells or fragments, whereas the latter measures only intact cells that survive sample processing and are visible in a sample matrix.

A variety of factors can thus affect results, particularly with the WC method, including variable uptake of the oligonucleotide probe due to cell permeability changes, cell lysis during sampling, preservation and processing; variable rRNA content or accessibility due to nutritional or environmental factors; and the variable detection of intact cells or cell fragments in fecal pellets and detritus. The SHA offers dramatic increases in sample throughput, but introduces uncertainties, such as those due to sample matrix effects (non-specific labeling and cross-reactions), variable rRNA levels in intact cells or to the possible presence of target rRNA in cell fragments, fecal pellets, or detritus. Molecular probes are powerful tools for monitoring and research applications, but more work is needed to compare and refine these different cell enumeration methods on field samples, as well as to assess the general validity of brightfield or fluorescent WC approaches.
Keywords: Alexandrium fundyense; Alexandrium ostenfeldii; Antibody; HAB; Molecular probes; Oligonucleotide

J. Ahmed, H.S. Ramaswamy, Effect of Temperature on Dynamic Rheology and Colour Degradation Kinetics of Date Paste, Food and Bioproducts Processing, Volume 83, Issue 3, September 2005, Pages 198-202, ISSN 0960-3085, DOI: 10.1205/fbp.04312.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVMY-5/2/f8a1e9847c20bb9c95f62e6697f0dbf8)
Abstract:
Date paste is an intermediate food product and used in various food formulations. The viscoelastic properties and visual colour degradation kinetics of date paste (Lulu cultivar) were investigated at selected temperatures. Small amplitude dynamic oscillation measurements exhibited viscoelasticity of date paste. The elastic modulus (G') values were consistently higher compared to viscous modulus (G'') at frequency ([omega]) range of 0.1 to 10 Hz. Both G' and G'' showed slight dependence on frequency however, the dependency decreased with temperature especially for elastic modulus. Complex viscosity ([eta]*) of paste decreased with temperature and followed a power type relationship with frequency. Date paste was classified as weak gel based on the overall mechanical spectra. Fractional conversion technique was used to represent thermal colour degradation kinetics of date paste at selected temperature range (70-120[degree sign]C). The combination of tristimulus Hunter colour values (L x a x b) adequately represented thermal colour degradation and followed the first order reaction kinetics. Dependence of rate constant during thermal processing followed the Arrhenius relationship with an activation energy value of 65.17 kJ mol.
Keywords: date paste; colour degradation; activation energy; viscoelastic fluid; complex viscosity

Laura W. Murchie, Malco Cruz-Romero, Joseph P. Kerry, Mark Linton, Margaret F. Patterson, Mary Smiddy, Alan L. Kelly, High pressure processing of shellfish: A review of microbiological and other quality aspects, Innovative Food Science & Emerging Technologies, Volume 6, Issue 3, September 2005, Pages 257-270, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.04.001.
(http://www.sciencedirect.com/science/article/B6W6D-4G9Y4YB-1/2/ad42190b419910e26ad188924fe55f81)
Abstract:
Many commercially important shellfish are filter feeders and, as a consequence, concentrate microbes from the surrounding waters. Shellfish may be relayed or depurated to reduce the level of microbial contamination, but the efficiency of these purification practices, particularly in relation to viruses and indigenous marine bacteria, is questionable. Therefore additional processing is necessary to ensure the safety of shellfish for human consumption. In recent years high pressure (HP) processing has been investigated as an alternative method for food preservation. HP technology allows inactivation of microorganisms while maintaining sensory and nutritional properties of foods. Currently, HP processing has several commercial food applications, including

oysters. As well as enhancing safety and extending shelf-life, HP treatment has the additional advantage of shucking or opening shellfish, making this technology particularly beneficial to the shellfish processing industry and consumers alike.Industrial relevance
High pressure (HP) processing is increasingly being used in the commercial processing of oysters, due to its minimal effects on sensory and nutritional quality, the opening or shucking of oysters during treatment, and the reduction of levels of Vibrio vulnificus, a pathogen of concern particularly in the US. However, little is known of the efficacy of HP treatment in reducing other pathogens in shellfish such as human enteric viruses, which are the predominant cause of shellfish-borne disease. This article reviews the inactivation of microorganisms of importance to shellfish, particularly viruses, the commercial HP processing of oysters and the advantages of HP technology as they pertain to the seafood industry.
Keywords: High pressure processing; Shellfish; Oysters; Vibrio; Viruses; Inactivation

W. Kowalczyk, C. Hartmann, C. Luscher, M. Pohl, A. Delgado, D. Knorr, Determination of thermophysical properties of foods under high hydrostatic pressure in combined experimental and theoretical approach, Innovative Food Science & Emerging Technologies, Volume 6, Issue 3, September 2005, Pages 318-326, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.03.007.
(http://www.sciencedirect.com/science/article/B6W6D-4GCXBNW-1/2/31ade9d0faa86ac7f8f3c04bd9627079)
Abstract:
In the present contribution high pressure phase change of food in a 3.4 ml high pressure chamber is investigated by means of numerical simulation and experimental techniques. The researches of freezing and thawing in samples of potato, pork and cod at atmospheric pressure and two high pressure levels up to 200 MPa are carried out. In order to enable numerical simulations at high pressures the comparison with experimental results and determination of thermophysical properties of food were necessary. The numerical model is based on the enthalpy method. Additionally, a dimensional analysis of phase transition is carried out. The results indicate a strong influence of high pressure on the kinetics of phase transition. Thermophysical properties of food at high pressure are determined and discussed.Industrial relevance
Knowledge about thermophysical properties and kinetics of freezing and thawing of food is of major importance for proper planning of industrial food processing and developing new technological processes. The proposed dimensional analysis enable the scale-up and transfer of explored in laboratories processes into the industrial scale.
Keywords: High hydrostatic pressure; Phase change; Numerical simulation; Thermophysical properties

Giuseppina Mandalari, Craig B. Faulds, Ana I. Sancho, Antonella Saija, Giuseppe Bisignano, Rosario LoCurto, Keith W. Waldron, Fractionation and characterisation of arabinoxylans from brewers' spent grain and wheat bran, Journal of Cereal Science, Volume 42, Issue 2, September 2005, Pages 205-212, ISSN 0733-5210, DOI: 10.1016/j.jcs.2005.03.001.
(http://www.sciencedirect.com/science/article/B6WHK-4G7X9MN-1/2/0e90cfdbf0f078e9943d0f854a6814d9)
Abstract:
Two agro-industrial co-products, brewers' spent grain and wheat bran, were fractionated by sequentially extracting with alkali of increasing strength. Over 60% of the brewers' grain biomass was solubilised by these treatments, compared with only 25% for wheat bran. The carbohydrate and phenolic composition of the solubilised fractions were determined, highlighting two compositionally different sets of fractions. In both co-products arabinoxylan was the main polysaccharide released. The degree of arabinose substitution of the extracted arabinoxylan diminished as the alkali strength increased. Insoluble residues contained both cellulose and non-cellulosic polysaccharides. In spent grain, the composition of the arabinoxylan in the residue was

similar to that of the starting material. In wheat bran, the residual xylan was very highly substituted with arabinose. Both ferulic acid and three forms of diferulic acid (5,5', 8-O-4' and 8,5') were present in the solubilised material, even after treatment with 4 M KOH. Esterified acetate was also present on polymers solubilised with KOH at concentrations up to 1 M. The more soluble fractions of spent grain represented a heterogeneous aggregation of feruloylated arabinoxylans with a broad molecular mass range, but the fractions extracted with stronger base were separated into low molecular weight moieties, presumably due to cleavage of covalent cross-links. Potential food and non-food uses for the isolated fractions from the cereal co-products are discussed.
Keywords: Arabinoxylan; Wheat; Barley; Brewers' spent grain; Cereal processing co-products; Ferulic acid; Diferulic acid; Cell walls; Phenolic acids; Carbohydrate

Sandy Slow, Marisa Donaggio, Peter J. Cressey, Michael Lever, Peter M. George, Stephen T. Chambers, The betaine content of New Zealand foods and estimated intake in the New Zealand diet, Journal of Food Composition and Analysis, Volume 18, Issue 6, September 2005, Pages 473-485, ISSN 0889-1575, DOI: 10.1016/j.jfca.2004.05.004.
(http://www.sciencedirect.com/science/article/B6WJH-4FFN4RJ-1/2/59fff51f9037e755a710925a4bf4ed6d)
Abstract:
We have measured the glycine betaine, proline betaine, trigonelline and dimethylsulphoniopropionate (DMSP) content of 74 predominantly processed foods. Combining these data with a previous survey (predominantly commodity based) and using data from the New Zealand National Nutrition Survey, the betaine intake in the average New Zealand diet has been estimated.
Typically, glycine betaine was primarily found at high levels ([greater-or-equal, slanted]150 [mu]g/g) in grain products (bread, pasta, flour), while proline betaine was found in fruit, especially oranges and orange juice and trigonelline was found in coffee. DMSP was only found in very small quantities (<10 [mu]g/g) in a small number of foods. Different sources of individual foods showed variation in betaine content and some food processing, particularly canning, affected betaine content, with betaine found in both the liquid and solid portions of the canned products. The mean intake (+/-) of glycine betaine, proline betaine and trigonelline in the average New Zealand diet was estimated at 298+/-4, 47+/-2 and 119+/-3 mg/day, respectively. Generally, men had higher betaine intakes than females and intake decreased with age.
Keywords: Glycine betaine; Proline betaine; Trigonelline; Dimethylsulphoniopropionate; DMSP; Dietary intake; Homocysteine; BHMT

F. Schwagele, Traceability from a European perspective, Meat Science, Volume 71, Issue 1, 51st International Congress of Meat Science and Technology (ICoMST), September 2005, Pages 164-173, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.03.002.
(http://www.sciencedirect.com/science/article/B6T9G-4FXWWYC-4/2/6e48eeb7e0baab7895b88de027b98449)
Abstract:
At pan-European level there is a need for traceability systems giving information on origin, processing, retailing and final destination of foodstuffs. Such systems shall enhance consumer confidence in food; enable the regulatory authorities to identify and to withdraw health hazardous and non-consumable foodstuffs from the market. Animal feeds are an element in this 'food-to-farm' approach to public health. Such feedstuffs are preliminary elements of some foods for human consumption, and hence are an inherent element of the food chain.
A harmonised pan-European food traceability protocol would greatly assist authorities in detecting fraud as well as dangerous substances. The food chain comprises a range of sequential and parallel stages bridging the full spectrum from agricultural production to the consumable foodstuffs

by consumers. EU legislation on traceability and the technologies needed to implement this system for meat and meat products are the focus of this paper.
Keywords: Traceability; Tracking; Meat; Meat products; Food; Feed

Andreas Schieber, Reinhold Carle, Occurrence of carotenoid cis-isomers in food: Technological, analytical, and nutritional implications, Trends in Food Science & Technology, Volume 16, Issue 9, Pigments in Food, September 2005, Pages 416-422, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.03.018.
(http://www.sciencedirect.com/science/article/B6VHY-4GWBDVC-1/2/7b83ff5fcface8e5f6c0def617c9a12c)
Abstract:
Carotenoids are important plant pigments and, therefore, constitute also part of the human diet. They predominantly occur in their all-trans configuration, however, processing may lead to the formation of cis-isomers which possess different biological properties such as decreased provitamin A activity, and altered bioavailability and antioxidant capacity. The objective of this contribution is to review the effects of processing on trans-cis-isomerization, with particular attention to [beta]-carotene, lycopene, lutein, and zeaxanthin as the most widespread and important carotenoids. Furthermore, aspects of carotenoid isomer analysis and bioavailability are also included in this treatise.

Luca Cocolin, Simone Stella, Raffaella Nappi, Elena Bozzetta, Carlo Cantoni, Giuseppe Comi, Analysis of PCR-based methods for characterization of Listeria monocytogenes strains isolated from different sources, International Journal of Food Microbiology, Volume 103, Issue 2, 25 August 2005, Pages 167-178, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.12.027.
(http://www.sciencedirect.com/science/article/B6T7K-4FM0P08-6/2/b7691a3b2447964e4859df948ff20ee7)
Abstract:
Listeria monocytogenes strains, isolated from various sources (food, environment, and animals), were used to test different PCR-based methods to investigate their capability to define the strain origin. RAPD-PCR with three primers and the SAU-PCR method, in which the DNA was first digested with the Sau3A restriction endonuclease and then amplified with a primer designed on the restriction site, were carried out, and the profiles obtained were used to perform cluster analysis. Based on the cluster analysis of Listeria spp. strains, obtained from international collections, the coefficient of similarity was selected. The results obtained showed that the methods tested in the study gave different levels of differentiation between the strains tested. The RAPD protocol using the P1254 primer and the SAU-PCR gave appreciable results only for strains isolated from animals and from a food processing plant in two different periods of the year 2003. Better differentiation was observed using the RAPD-PCR with primer D8635. As a matter of fact, it was able to distinguish L. monocytogenes obtained from different species of animals, different food samples and strains from the same production plant isolated in different periods of the year. Also primer M13 gave positive results, but the coefficient of similarity to use had to be increased to 80%. On the basis of the results observed, RAPD-PCR with primers D8635 and M13 should be considered reliable tools for epidemiological investigations focusing on L. monocytogenes.
Keywords: Listeria monocytogenes; RAPD-PCR; SAU-PCR; Molecular characterization

Mekonnen Tsegaye, Mogessie Ashenafi, Fate of Escherichia coli O157:H7 during the processing and storage of Ergo and Ayib, traditional Ethiopian dairy products, International Journal of Food Microbiology, Volume 103, Issue 1, 15 August 2005, Pages 11-21, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.12.006.
(http://www.sciencedirect.com/science/article/B6T7K-4GSJX78-1/2/0cf4089ff8b9fcdeec584acd5b2cca36)

Abstract:
The long-term survival of E. coli O157:H7 in acid foods is well documented. This prompted us to evaluate the organism's survival during the making of Ergo, a traditional Ethiopian sour milk and Ayib, a traditional Ethiopian cottage cheese and during storage of these products at both ambient and refrigeration temperatures. E. coli O157:H7 test strains were separately inoculated into milk at initial levels of log10 3 cfu/ml. Levels of E. coli O157:H7 in the absence of lactic acid bacteria (LAB) reached log10 8.4 cfu/ml at 24 h as the pH dropped to 5.6+/-1.0. In milk inoculated with LAB (log10 6.4 cfu/ml) and E. coli O157:H7 (log10 3 cfu/ml), levels of LAB were log10 9.6 cfu/ml and 9.4 cfu/ml at 24 h and 72 h, respectively, and the pH values were 3.5 and 3.9, respectively. In the presence of LAB, E. coli O157:H7 grew to log10 6.5 cfu/ml at 24 h, with the levels decreasing to log10 3.2 cfu/ml at 72 h. Post-fermentation inoculation of E. coli O157:H7 in Ergo at an initial level of log10 3 cfu/ml, resulted in complete elimination of test organisms at 6 h at ambient temperature storage, but they were recovered until 72 h at refrigerated storage. At a higher initial inoculum level (log10 6 cfu/ml) of the E. coli O157:H7, the counts decreased by 4 logs within 12 h (pH 4.2) at ambient temperature storage, and complete elimination was observed at 36 h (pH 4.0). At refrigeration temperature, counts at 72 h were between 2.2 and 3.5 log cfu/ml for the different strains. During Ayib processing, E. coli O157:H7 in souring milk increased by 3 logs in 24 h, with a slight reduction being observed at 36 h. The pH dropped to 4.3 during this time. The numbers of E. coli O157:H7, immediately after curd cooking, were below detectable levels, but could be recovered by enrichment. Complete inactivation was observed on 24 h after curd cooking. When E. coli O157:H7 was inoculated into steam-treated Ayib (pH 4.2-4.3) at levels of log10 6.0-6.7 cfu/g and maintained at ambient temperatures, there was a gradual decrease in numbers to 3.7-4.3 logs by day 3. After day 7, pH values were 3.8-3.9 and E. coli O157:H7 was only detectable after enrichment. E. coli O157:H7 strain MF-1847 was completely inactivated by day 9, but the other two strains could still be recovered by enrichment at this time. At refrigeration storage, decrease in count of the test strains was gradual and counts at day 8 and 9 were >4 log cfu/g. As Ergo is preferably consumed soon after (24 h) fermentation, traditional fermentation of Ergo would not guarantee that E. coli O157:H7 can be controlled and, therefore, Ergo can be a potential health hazard if prepared from milk contaminated with E. coli O157:H7.
Keywords: E. coli O157:H7; Ergo; Traditional sour milk; Ayib; Cottage cheese; Fermentation; Storage temperatures

V.M. Gomez-Lopez, F. Devlieghere, V. Bonduelle, J. Debevere, Intense light pulses decontamination of minimally processed vegetables and their shelf-life, International Journal of Food Microbiology, Volume 103, Issue 1, 15 August 2005, Pages 79-89, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.11.028.
(http://www.sciencedirect.com/science/article/B6T7K-4FHJGD8-B/2/1211dccd159ab8b73c1c6d876f6605d1)
Abstract:
Intense light pulses (ILP) is a new method intended for decontamination of food surfaces by killing microorganisms using short time high frequency pulses of an intense broad spectrum, rich in UV-C light. This work studied in a first step the effect of food components on the killing efficiency of ILP. In a second step, the decontamination of eight minimally processed (MP) vegetables by ILP was evaluated, and thirdly, the effect of this treatment on the shelf-life of MP cabbage and lettuce stored at 7 [degree sign]C in equilibrium modified atmosphere packages was assessed by monitoring headspace gas concentrations, microbial populations and sensory attributes. Proteins and oil decreased the decontamination effect of ILP, whilst carbohydrates and water showed variable results depending on the microorganism. For this reason, high protein and fat containing food products have little potential to be efficiently treated by ILP. Vegetables, on the other hand, do not contain high concentrations of both compounds and could therefore be suitable for ILP treatment. For the eight tested MP vegetables, log reductions up to 2.04 were achieved on aerobic

mesophilic counts. For the shelf-life studies, respiration rates at 3% O2 and 7 [degree sign]C were 14.63, 17.89, 9.17 and 16.83 ml O2/h kg produce for control and treated cabbage, and control and treated lettuce respectively; used packaging configurations prevented anoxic conditions during the storage times. Log reductions of 0.54 and 0.46 for aerobic psychrothrophic count (APC) were achieved after flashing MP cabbage and lettuce respectively. APC of treated cabbage became equal than that from control at day 2, and higher at day 7, when the tolerance limit (8 log) was reached and the panel detected the presence of unacceptable levels of off-odours. Control never reached 8 log in APC and were sensory acceptable until the end of the experiment (9 days). In MP lettuce, APC of controls reached rejectable levels at day 2, whilst that of treated samples did after 3 days. Both samples were sensory unacceptable at day 3, controls because of bad overall visual quality (OVQ), off-odour and leaf edge browning and treated samples due to bad OVQ; browning inhibitors might be proposed to preserve OVQ. Yeasts and lactic acid bacteria counts were low in all the samples. It seems that ILP treatment alone under the conditions used in this work does not increase MP vegetables shelf-life in spite of the reduction in the initial microbial load.
Keywords: Intense light pulses; Minimally processing; Fresh-cut vegetables; Decontamination; Shelf-life

Deniz Cekmecelioglu, Ali Demirci, Robert E. Graves, Nadine H. Davitt, Applicability of Optimised In-vessel Food Waste Composting for Windrow Systems, Biosystems Engineering, Volume 91, Issue 4, August 2005, Pages 479-486, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2005.04.013.
(http://www.sciencedirect.com/science/article/B6WXV-4GCX1JT-3/2/7362db092f7630cdbd3c5c87b870722c)
Abstract:
The presence of pathogens in various organic wastes requires careful attention to the composting process to minimise the chance of their survival. An optimised composting mixture from previous in-vessel composting studies (50% food waste, 40% manure, and 10% bulking agent) was evaluated using windrow composting. Conventional layering and mixing methods were used for constructing the windrows. Temperature was monitored as the indication of the efficiency of composting. Initial and final physico-chemical characteristics (moisture content, C/N ratio, pH, and volatile solids) and microbial survival were also determined. There was no significant difference between the observed peak temperatures in spreader and mixer windrows (probability P>0[middle dot]05). Leaching problems and structural instability were observed within the first 15-20 days. In spreader windrows, populations of faecal coliform, faecal streptococcus, Salmonella, and Escherichia coli O157:H7, in most probable number (MPN), were reduced from 418-432 MPN/g[dry compost] to 5[middle dot]2-8[middle dot]4, 78[middle dot]8-396[middle dot]0, 18[middle dot]0-59[middle dot]4, 5[middle dot]2-5[middle dot]7 MPN/g[dry compost], whereas for mixer windrows were decreased from initial values of 431-447 MPN/g[dry compost] to final values of 7[middle dot]8-8[middle dot]0, 413[middle dot]4-425[middle dot]5, 0[middle dot]5-33[middle dot]6, 6[middle dot]1-29[middle dot]2 MPN/g[dry compost], respectively. The results from this study suggested the use of faecal coliforms as indicators for Salmonella (coefficient of determination r2=0[middle dot]94-0[middle dot]99) and E. coli O157:H7 (r2=0[middle dot]89-0[middle dot]98), but did not recommend faecal streptococcus as an indicator microorganism for Salmonella (r2=0[middle dot]37-0[middle dot]39) and E. coli O157:H7 (r2=0[middle dot]11-0[middle dot]48). In conclusion, the optimum compost mixture determined from in-vessel system was composted more successfully in windrows than the in-vessel system due to higher temperatures maintained for a longer period of time and extended processing time in windrows. Further study is needed to eliminate the leaching and structural instability problems.

R.Y. Murphy, R.E. Hanson, L.K. Duncan, N. Feze, B.G. Lyon, Considerations for post-lethality treatments to reduce Listeria monocytogenes from fully cooked bologna using ambient and

pressurized steam, Food Microbiology, Volume 22, Issue 4, August 2005, Pages 359-365, ISSN 0740-0020, DOI: 10.1016/j.fm.2004.09.009.
(http://www.sciencedirect.com/science/article/B6WFP-4F032B8-B/2/00bfb6da90ada74bc848ed9aa3392d96)
Abstract:
During processing of ready-to-eat (RTE) deli meats, any secondary processing procedures such as peeling and cutting introduce the distinct possibility of cross-contamination between equipment, personnel, and food. To eliminate or reduce pathogens such as Listeria monocytogenes and ensure food safety, RTE deli meats can be pasteurized prior to or after packaging. In this study, ambient steam in-package pasteurization was compared with pressurized steam prepackaging pasteurization to reduce L. monocytogenes from fully cooked RTE bologna. The bologna (14 cm diameterx1.5 cm thickness) samples were surface-inoculated to contain about 8 log10 of L. monocytogenes. To achieve 2 log reductions for L. monocytogenes, the bologna samples needed to be treated for about 10 s in pressurized steam at 131 [degree sign]C or for about 2.5 min in ambient steam at 100 [degree sign]C. The pasteurization time using pressurized steam treatment was about 75-90% shorter than using ambient steam treatment. Pressurized steam treatment may be integrated into a vacuum packaging unit to effectively eradicate L. monocytogenes from RTE meats just prior to sealing the retail packages to further reduce the treatment time, avoid post-treatment recontaminations by pathogens, and improve food safety without detrimentally affecting meat quality.
Keywords: Post-lethality treatment; Ready-to-eat; Deli meats; Pasteurization; Quality; Listeria monocytogenes

Massimo Migliori, Domenico Gabriele, Bruno de Cindio, Claudio M. Pollini, Modelling of high quality pasta drying: mathematical model and validation, Journal of Food Engineering, Volume 69, Issue 4, August 2005, Pages 387-397, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.08.033.
(http://www.sciencedirect.com/science/article/B6T8J-4DK67J3-2/2/c49bb9cf7947c72e5a3f65bc7c299053)
Abstract:
The pasta drying process was studied using an engineering approach. The phenomena of mass and heat exchange between pasta samples and air was modelled according to the classic transport approach applied to a hollow cylindrical shape pasta. Data from the literature and from measurements were used to fix the material parameter values of both the air and dough phases. Theoretical correlations were used to obtain a good estimate of mass and heat exchange coefficients between dough samples and air. The proposed model was set by choosing the mass transfer coefficient as the unique optimisation parameter, determined by best fitting of the experimental water content data obtained under given conditions in a static dryer. The model was then validated at different temperature and air humidity drying profiles and a good agreement with the experimental results was found. Finally the model was applied to different process conditions and the drying time was calculated from the simulations.
Keywords: Drying; Food processing; Heat transfer; Mass transfer; Modelling; Pasta production

J.S. Torrecilla, L. Otero, P.D. Sanz, Artificial neural networks: a promising tool to design and optimize high-pressure food processes, Journal of Food Engineering, Volume 69, Issue 3, August 2005, Pages 299-306, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.08.020.
(http://www.sciencedirect.com/science/article/B6T8J-4DGDB28-8/2/126860da71d52689270c869ef975b814)
Abstract:
In this work, an artificial neural network (ANN) is used to predict two parameters of interest for high-pressure food processing: the maximum or minimum temperature reached in the sample after pressurization and the time needed for thermal re-equilibration in the high-pressure system. Both

variables together represent in a reliable form the temperature evolution during the high-pressure process. The ANN was trained with a data file composed of: applied pressure, pressure increase rate, set point temperature, high-pressure vessel temperature and ambient temperature altogether with the parameters to predict. After a proper training, the ANN was able to make predictions accurately and therefore, it becomes a useful tool to design and optimize high-pressure processes in the food industry where the pressure/temperature evolution is an essential factor to control the microbiological and/or enzymatic activity of the products.
Keywords: Artificial neural networks; High-pressure; Modeling; Food processing; Heat transfer

C.I. Nindo, J. Tang, J.R. Powers, P. Singh, Viscosity of blueberry and raspberry juices for processing applications, Journal of Food Engineering, Volume 69, Issue 3, August 2005, Pages 343-350, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.08.025.
(http://www.sciencedirect.com/science/article/B6T8J-4DGW5W6-2/2/d8aecf25ff057ca9f417217145337e36)
Abstract:
Rheological behavior of blueberry and red raspberry juice concentrates were studied with the objective of defining suitable mathematical models for use in evaporation and other processing procedures. The flow properties were determined for juice with solids content of up to 65[degree sign] Brix and temperatures between 20 and 60 [degree sign]C. The two juice products are predominantly Newtonian over the range of temperature and solids content studied. For a given solids content, raspberry juice showed a slightly higher activation energy than blueberry juice (for example, at 65[degree sign] Brix the values are 41.2 and 39.1 kJ/mol, respectively). With juices containing 10% and 55% dissolved solids, flow instability (Taylor vortices) occurred in the concentric cylinder gap when shear rates reached 180 s-1 and 1000 s-1, respectively. Determination of laminar flow boundaries is important for accurate characterization of flow behavior of fluid foods for processing applications. The mathematical models obtained in this study would be useful for spot determination of juice viscosity during evaporation.
Keywords: Taylor vortices; Refractance window; Evaporation; Activation energy; Viscosity model

M.R. Moreira, A.G Ponce, C.E. del Valle, S.I. Roura, Inhibitory parameters of essential oils to reduce a foodborne pathogen, LWT - Food Science and Technology, Volume 38, Issue 5, August 2005, Pages 565-570, ISSN 0023-6438, DOI: 10.1016/j.lwt.2004.07.012.
(http://www.sciencedirect.com/science/article/B6WMV-4FR3GG6-2/2/e89e7f138eeb7a60b16d3f067d41aae8)
Abstract:
Technological application of essential oils, as natural sanitizing agents, to reduce food pathogens in the post-harvest processing of foods requires the establishment of the optimal conditions. The present work evaluated the parameters of antimicrobial activity of the essential oils of eucalyptus (Eucalyptus globules), tea tree (Melaleuca alternifolia), rosemary (Rosmarinus officinalis), mint (Mentha piperita), rosa moschata (Rosa moschata), clove (Syzygium aromaticum), lemon (Citrus limonum), oregano (Origanum vulgare), pine (Pinus silvestrys) and sweet basil (Ocimum basilicum) on survival and growth of different strains of E. coli O157:H7. The strains of E. coli exhibited similar susceptibilities to the action of the essential oils assayed. The essential oil with the lowest MIC and MBC (Minimum Inhibitory and Bactericidal Concentration, respectively) was clove (0.25 ml/100 ml and 0.3 ml/100 ml, respectively) and the results demonstrated that clove exerted a significant bactericidal and bacteriostatic action.
Keywords: Sanitizing agents; Naturals essential oils; Pathogens control; Antimicrobial activity

Federico Gomez Galindo, Pietro Rocculi, Lars Wadso, Ingegerd Sjoholm, The potential of isothermal calorimetry in monitoring and predicting quality changes during processing and storage

of minimally processed fruits and vegetables, Trends in Food Science & Technology, Volume 16, Issue 8, August 2005, Pages 325-331, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.01.008.
(http://www.sciencedirect.com/science/article/B6VHY-4FTS2W9-3/2/d346bf07ce919c0ae89d4cb6c84cd307)
Abstract:
We review the potential of isothermal calorimetry as an analytical tool to provide an integrated view of the effect of different processing steps on the quality and shelf life of minimally processed fruits and vegetables. Variations in processing operations involved in product development in the food industry are studied through a factory scenario to show the versatility of the technique in monitoring and predicting changes in quality of minimally processed horticultural products.

Hikmate Abriouel, Rosario Lucas, Nabil Ben Omar, Eva Valdivia, Mercedes Maqueda, Magdalena Martinez-Canamero, Antonio Galvez, Enterocin AS-48RJ: a variant of enterocin AS-48 chromosomally encoded by Enterococcus faecium RJ16 isolated from food, Systematic and Applied Microbiology, Volume 28, Issue 5, 20 July 2005, Pages 383-397, ISSN 0723-2020, DOI: 10.1016/j.syapm.2005.01.007.
(http://www.sciencedirect.com/science/article/B7GVX-4FHJY9X-1/2/20346f222be21228d4a4c89d67fbeaba)
Abstract:
The bacteriocinogenic strain RJ16 isolated from goat cheese has been identified as Enterococcus faecium by species-specific PCR, DNA-rRNA hybridization and rDNA sequencing. Purified bacteriocin from strain RJ16 is a carboxypeptidase A-resistant peptide with a molecular mass (7125 Da) very close to the cyclic peptide enterocin AS-48. Bacteriocin from strain RJ16 and AS-48 show identical antibacterial spectra, although the former is slightly less active on strains of Listeria monocytogenes and Bacillus cereus. Producer strains show cross-immunity. PCR amplification of total DNA from strain RJ16 with primers for the AS-48 structural gene and sequencing of the amplified fragment revealed an almost identical sequence (99.5%), except for a single mutation that predicts the change of Glu residue at position 20 of AS-48 to Val. Therefore, bacteriocin produced by E. faecium RJ16 should be considered a variant of AS-48, which we call AS-48RJ. PCR amplification revealed that strain RJ16 contains the complete as-48 gene cluster. Hybridization with probes for as-48 gene cluster revealed a chromosomal location of as-48 genes in strain RJ16, being the first example of a chromosomal location of this bacteriocin trait. Strain RJ16 produced enzymes of interest in food processing (esterase, esterase lipase and phytase activities), and did not decarboxylate amino acids precursors for biogenic amines. Strain RJ16 did not exhibit haemolytic or gelatinase activities, and PCR amplification revealed the lack of genes encoding for known virulence determinants (aggregation substance, collagen adhesin, enterococcal surface protein, endocarditis antigens, as well as haemolysin and gelatinase production). Strain RJ16 was resistant to ciprofloxacin () and levofloxacin () and showed intermediate resistance to nitrofurantoin and erythromycin, but was sensitive to ampicillin, penicillin, streptomycin, gentamicin, rifampicin, chloramphenicol, tetracycline, quinupristin/dalfopristin, vancomycin and teicoplanin. Altogether, results from this study suggest that this broad-spectrum bacteriocin-producing strain may have a potential use in food preservation.
Keywords: Bacteriocin; Enterococcus faecium

William H. Sperber, HACCP and transparency, Food Control, Volume 16, Issue 6, 5th International Meeting of the Noordwijk Food Safety and HACCP Forum, July 2005, Pages 505-509, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2003.10.012.
(http://www.sciencedirect.com/science/article/B6T6S-4BYR56H-4/2/b17fcf7ae349977f10a6bd0caa94d578)
Abstract:

Twenty years after its first publication in the US, the HACCP system of food safety approached its current pinnacle of success in 1992 with the virtually simultaneous publication of HACCP principles and guidelines for application documents by the NACMCF and the CAC/CFH. Since then, the necessary foundation of prerequisite programs has been elaborated. Both HACCP documents were refined in 1997. All of these developments were entirely transparent. In recent years, the US regulatory agencies have promulgated three major HACCP rules for specific segments of the industry: meat and poultry products (1996), fish and fishery products (1997), and juices (2001). These specific HACCP rules, rather than maintaining the transparency of the global HACCP documents, have clouded the waters. A somewhat similar development can be noted in the EU's application of its precautionary principle. HACCP cannot provide greater transparency in the food supply chain in the context of this type of opaque regulatory environment. Rather, greater transparency, and improved public health protection, must be realized through the development of voluntary science based systems, especially involving the food processing industry, where the very idea of HACCP was conceived and implemented.
Keywords: HACCP; Transparency; Food safety; Regulations; Precautionary principle

William H. Sperber, HACCP does not work from Farm to Table, Food Control, Volume 16, Issue 6, 5th International Meeting of the Noordwijk Food Safety and HACCP Forum, July 2005, Pages 511-514, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2003.10.013.
(http://www.sciencedirect.com/science/article/B6T6S-4C4W446-2/2/88041a2ce8a894240df4fc59b046477e)
Abstract:
Because of its inability to detect hazards that occur a low incidence, the quality control system was supplanted by the HACCP system to provide assurance of food safety. The global use and success of the HACCP system in the food processing industry created false expectations that it could be used successfully in all steps of the food supply chain, from Farm to Table. However, the lack of definitive critical control points that could eliminate or control identified hazards prevents the effective use of HACCP in all steps of the supply chain. Food safety measures can be used at each step in the supply chain, but most of these measures will be prerequisite programs rather that critical control points from a HACCP system. To better focus on the application of effective food safety control measures, we must communicate in terms of 'Farm to Table Food Safety', rather than 'Farm to Table HACCP'.
Keywords: HACCP; Prerequisite programs; Quality control; Farm-to-table

Yasmine Motarjemi, Sara Mortimore, Industry's need and expectations to meet food safety, 5th International Meeting: Noordwijk Food Safety and HACCP Forum 9-10 December 2002, Food Control, Volume 16, Issue 6, 5th International Meeting of the Noordwijk Food Safety and HACCP Forum, July 2005, Pages 523-529, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.10.014.
(http://www.sciencedirect.com/science/article/B6T6S-4F9739K-1/2/11153837ce09f447747bcf2f25c03c55)
Abstract:
Producing, processing or manufacturing foods which meet consumers' and society's expectations is a very complex undertaking. On one hand, we live in a world where the socio-economical situation and infrastructure, the environment, cultural values and regulatory requirements are different; on the other hand, the movement of people, trade of goods and services as well as communication have made food safety a global concern. Furthermore, everyday we are faced with new scientific findings bringing with them new hazards and new challenges. Therefore, ensuring food safety in today's complex world is a daunting task and is possible only with a concerted effort of all sectors including government, consumer organizations and industry - a concept that the World Health Organisation referred to as the concept of Shared Responsibility. In spite of this, in many countries, in particular in Europe, there is sometimes a feeling of distrust towards the

industry. This hampers effective collaboration between different sectors whereas, in today's complex world, dialogue and partnership are needed more than ever. The present article outlines the needs and expectations of the food industry from other sectors so that it can meet its objectives, i.e. to provide consumers with safe and wholesome food and to contribute to their health.
Keywords: Food safety; Food policy; Regulations; Consumer perception; Media; Food industry

Joanna Szymonska, Krystyna Wodnicka, Effect of multiple freezing and thawing on the surface and functional properties of granular potato starch, Food Hydrocolloids, Volume 19, Issue 4, July 2005, Pages 753-760, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2004.08.004.
(http://www.sciencedirect.com/science/article/B6VP9-4DPH17C-1/2/a73e3e9d566c445b14a4877237e6f224)
Abstract:
Influence of multiple freezing and thawing on the porosity of potato starch granules was determined with a nitrogen sorption method. As a consequence of the processing, the granule specific surface area and the size of granule pores significantly increased, whereas the true (helium) density of the granules noticeably decreased. The effect depended on freezing conditions and the moisture content in starch. The most pronounced result was achieved on gradual freezing of ambient native granular starch containing 13% (w/w) water. In that case, after 10 freezing/thawing cycles, specific surface area of granules increased from initial 0.36 to 1.64 m2/g. Single deep freezing in liquid nitrogen of oven-dried starch (8% w/w of moisture) in water suspension resulted in the increase of the granule initial total pore volume and the mean pore diameter by five and almost three times, respectively. The processing notably influenced wetting ability and [alpha]-amylase digestibility of the granules. The obtained data could be helpful in evaluation of storage stability of potato starch-based foodstuffs. Due to its modified physical properties, granular potato starch subjected to multiple freezing and thawing could be suitable for new applications in food technology or pharmacology.
Keywords: Potato starch wetting ability; Starch granule density; Starch granule porosity

V.B. Vikram, M.N. Ramesh, S.G. Prapulla, Thermal degradation kinetics of nutrients in orange juice heated by electromagnetic and conventional methods, Journal of Food Engineering, Volume 69, Issue 1, July 2005, Pages 31-40, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.07.013.
(http://www.sciencedirect.com/science/article/B6T8J-4DFT3RB-1/2/23be55fff05b9689cc968a3164347f0a)
Abstract:
Newer processing technologies like infrared, microwave processing are being harnessed to optimize the processes to ensure minimum loss of the vital nutrients in processed foods. Vitamin C is an important nutrient known for its potential antioxidant, anticancerous and other health promoting properties. Orange juice is a very popular and rich source of vitamin C. The present research focuses on the status of the vitamin C during thermal treatment of orange juice heated by different methods. The study includes a comparative study of kinetics of vitamin degradation and changes in visual colour as an index of carotenoids. The degradation kinetics of vitamin C and colour in terms of reaction rate constant, destruction kinetics, enthalpy and entropy for different methods of heating are discussed. The destruction of vitamin C was influenced by the method of heating and the temperature of processing. The degradation was highest during microwave heating due to uncontrolled temperature generated during processing. Out of the four methods studied, ohmic heating gave the best result facilitating better vitamin retention at all temperatures. The visual colour is generally used an index of the carotenoid content. The activation energies for both vitamin and colour were within the range of literature reported values of 7.54-125.6 kJ/mol. The activation enthalpies agreed with the literature values of vitamin destruction of other food

products. The z values also were within the literature values of 20-30 [degree sign]C for vitamin destruction, except for microwave heating.
Keywords: Vitamin C; Thermal processing; Degradation; Carotenoids; Kinetics

Chun-Chieh Yang, Kuanglin Chao, Yud-Ren Chen, Development of multispectral image processing algorithms for identification of wholesome, septicemic, and inflammatory process chickens, Journal of Food Engineering, Volume 69, Issue 2, July 2005, Pages 225-234, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.07.021.
(http://www.sciencedirect.com/science/article/B6T8J-4DGDB28-6/2/d755662881c6e942d4e290b2127d413f)
Abstract:
A multispectral imaging system and image processing algorithms for food safety inspection of poultry carcasses were demonstrated. Three key wavelengths of 460, 540, and 700 nm, previously identified using a visible/near-infrared spectrophotometer, were implemented in a common-aperture multispectral imaging system, and images were collected for 174 wholesome, 75 inflammatory process, and 170 septicemic chickens. Principal component analysis was used to develop an algorithm for separating septicemic chickens from wholesome and IP chickens based on average intensity of first component images. A threshold value of 105 was able to correctly separate 95.6% of septicemic chickens. To differentiate inflammatory process chickens, a region of interest was defined from which spectral features were determined. The algorithm was able to correctly identify 100% of inflammatory process chickens by detecting pixels that satisfied the spectral feature conditions. A decision tree model was created to classify the three chicken conditions using inputs from the two image processing algorithms. The results showed that 89.6% of wholesome, 92.3% of inflammatory process, and 94.4% of septicemic chickens were correctly classified.
Keywords: Food safety; Machine vision; Poultry

Niels Skovgaard, Richardson, Philip, (Ed.), Improving the Thermal Processing of Foods. CRC Press, Woodhead Publishing, Cambridge, England, 2004, vii + 507 pages, hardback, [pound sign]115.00/US$190.00/[euro]160.00; ISBN 1 85573 730 2; CRC Press order number: WP2549, ., International Journal of Food Microbiology, Volume 101, Issue 3, 15 June 2005, Pages 351-352, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.01.007.
(http://www.sciencedirect.com/science/article/B6T7K-4FH4V5W-2/2/265781560059c6c361c18387fbf34183)

U. E. Umoren, A. I. Essien, B. A. Ukorebi, E. B. Essien, Chemical evaluation of the seeds of Milletia obanensis, Food Chemistry, Volume 91, Issue 2, June 2005, Pages 195-201, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2003.08.029.
(http://www.sciencedirect.com/science/article/B6T6R-4DXC2WN-2/2/04be77454ce86c3612c083de959f040f)
Abstract:
A study was conduced to evaluate the nutritional potential of Milletia obanensis 'Odudu' as a possible food or feedstuff and to assess the effect of various processing methods on its nutritional quality. Results of proximate analysis showed that the raw seeds contained 26.7% crude protein, 23.5% ether extract, 3.47% crude fibre, 4.37% ash and 42.0% nitrogen free extract. The protein was well supplied with essential and non-essential amino acids, though the values were low when compared with popular seed legumes. Minerals were in fair supply: P 3.10, Mg 92.30, K 45.25 and Fe 2.20 mg/100 g. Processing methods significantly ($p<0.05$) affected the nutritional composition. While autoclaving, boiling and toasting (heat treatment) increased the protein content, it reduced the levels of anti-nutritional factors-phytate, tannins, oxalates, cyanogenic glycosides and (slightly)

saponin. Thus, it was concluded that M. obanensis seeds, if properly processed, could serve as livestock feed or food for man.
Keywords: Chemical evaluation; Nutritional potential; Milletia obanensis; Processing methods; Antinutritional factors; Amino acids

Agnieszka Nawirska, Monika Kwasniewska, Dietary fibre fractions from fruit and vegetable processing waste, Food Chemistry, Volume 91, Issue 2, June 2005, Pages 221-225, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2003.10.005.
(http://www.sciencedirect.com/science/article/B6T6R-4DXC2WN-4/2/aa078d66b87205b772458e87a355e939)
Abstract:
Until recently, dietary fibre and its components were regarded as balast substances from vegetal food. These days, they are given increasing attention because of the beneficial physiological effects they may exert on human and animal organisms. Dietary fibre includes a number of components, and each of them displays specific properties. The components of major importance are cellulose, hemicellulose, lignin and pectins. The objective of this study was to determine the amounts of particular dietary fibre fractions in samples containing apple, black currant, chokeberry, pear, cherry and carrot pomace. The results revealed the following pattern: in each pomace sample, pectins occurred in the smallest amounts, and the content of lignin was very high (black currant and cherry pomace) or comparatively high (pear, chokeberry, apple and carrot pomace). The other dietary fibre components were difficult to form into clearly defined groups. Their proportions varied from one pomace type to another.
Keywords: Fruit and vegetable pomace; Non-starch polysaccharides

Zia-ur Rehman, W.H. Shah, Thermal heat processing effects on antinutrients, protein and starch digestibility of food legumes, Food Chemistry, Volume 91, Issue 2, June 2005, Pages 327-331, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.06.019.
(http://www.sciencedirect.com/science/article/B6T6R-4D5P57Y-2/2/0b1da4588942c7509ad3b0567769ce61)
Abstract:
Thermal heat processing effects were investigated on antinutrients, protein and, starch digestibility of black grams, chick peas, lentils, red and white kidney beans. The tannin and phytic acid contents in these five food legumes ranged from 770-1100 mg/100 g to 970-1440 mg/100 g, respectively, whereas protein and starch digestibilities of the raw food legumes were 33.0-37.6% and 36.8-42.0%, respectively. Reduction in the levels of antinutrients, along with an improvement in protein and starch digestibility, was observed after cooking these food legumes. Antinutrient, including tannin (33.1-45.7%) and phytic acid (28.0-51.6%) contents, were reduced by different thermal heat treatments (121AC10, 121AC20, 121AC40, 121AC60, 121AC90, 128AC20). Maximum improvement in protein (95.7-105%) and starch (117-138%) digestibilities was observed on cooking these food legumes at 121 [degree sign]C for 10 min (121AC10). However, ordinary cooking resulted in improvement of protein and starch digestibilities of the food legumes by 86.0-93.3% and 84.0-90.4%, respectively.
Keywords: Thermal heat processing; Antinutrients; Protein digestibility; Starch digestibility

Si-Quan Li, Howard Q. Zhang, Tony Z. Jin, Evan J. Turek, Ming H. Lau, Elimination of Lactobacillus plantarum and achievement of shelf stable model salad dressing by pilot scale pulsed electric fields combined with mild heat, Innovative Food Science & Emerging Technologies, Volume 6, Issue 2, June 2005, Pages 125-133, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.01.001.
(http://www.sciencedirect.com/science/article/B6W6D-4FR3NM9-2/2/a199fb206d2a7e0ac4005b4f86a16401)

Abstract:
Model salad dressing inoculated with Lactobacillus plantarum 8014 was subjected to pulsed electric fields (PEF)-only processing and PEF followed by a mild heat treatment. More than 7 log inactivation was achieved by using PEF-only processing at 34 kV/cm for 45.7 [mu]s with minimal heat contribution. Samples for shelf life evaluation were aseptically packed in 4-oz HIPS/EVOH/PE cups using a Benco(R) system. The PEF-treated samples were stable at 4 [degree sign]C for the 8-week evaluation period. However, L. plantarum in the samples treated with PEF-only grew up to more than 109 cfu/ml in 1 week at room temperature. PEF processing at 31.8 kV/cm for 45 [mu]s followed by a mild heat processing at 67.2~73.6 [degree sign]C for 24 s resulted in a shelf stable product with an initial L. plantarum load of 3.7x103 cfu/ml. No L. plantarum 8014 recovered in the model salad dressing at room temperature for at least 1 year.Industrial relevance
Pulsed electric field processing is on the verge of entering industrial scale processing. Consequently pilot scale data are essential for process scale up purposes. Increasing evidence is currently occumulated that PEF in conjunction with moderate heat treatment is not only an attractive minimal processing alternative but also interesting in terms of energy efficiency and low environmental impacts for pasteurization of foods. This paper is one example for such process development for food materials with low (103 cfu/ml) initial microbial counts.

Vijay K. Juneja, Harry M. Marks, Heat resistance kinetics variation among various isolates of Escherichia coli, Innovative Food Science & Emerging Technologies, Volume 6, Issue 2, June 2005, Pages 155-161, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.03.008.
(http://www.sciencedirect.com/science/article/B6W6D-4FR8PPD-2/2/6e1fa77404ec9b7b37f730aadac968e6)
Abstract:
This paper reports an investigation of serotype-specific differences in heat resistance kinetics of clinical and food isolates of Escherichia coli. Heat resistance kinetics for 5 serotypes of E. coli at 60 [degree sign]C were estimated in beef gravy using a submerged coil heating apparatus. The observed survival curves were sigmoidal and there were significant differences (p=0.05) of the survival curves among the serotypes. Consequently, a model was developed that accounted for the sigmoidal shape of the survival curves and the serotype effects. Specifically, variance components for serotypes and replicates within serotypes were estimated using mixed effect nonlinear modeling. If it is assumed that the studied serotypes represent a random sample from a population of E. coli strains or serotypes, then, from the derived estimates, probability intervals of the expected lethality for random selected serotypes can be computed. For example, expected serotype-specific lethalities at 60 [degree sign]C for 10 min are estimated to range between 5 and 9 log10 with 95% probability. On the other hand, to obtain a 6-log10 lethality, the expected minutes range, with 95% probability, from 6 to 12 min. The results from this study show that serotypes of E. coli display a wide range of heat resistance with nonlinear survival curves.Industrial relevance
This paper is of high current interest since it deals with the ongoing international debate on log linear vs. non-log linear microbial inactivation curves observed during thermal and non-thermal processing. The data on 5 serotypes of E. coli indicate a clear need for further studies with more strains to fully characterize the heat resistance kinetics for E. coli.
Keywords: Survival curves; Variance components; Nonlinear mixed effects

Apinan Soottitantawat, Kohei Takayama, Kenji Okamura, Daisuke Muranaka, Hidefumi Yoshii, Takeshi Furuta, Masaaki Ohkawara, Pekka Linko, Microencapsulation of l-menthol by spray drying and its release characteristics, Innovative Food Science & Emerging Technologies, Volume 6, Issue 2, June 2005, Pages 163-170, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.11.007.
(http://www.sciencedirect.com/science/article/B6W6D-4FPDR6S-1/2/cdecade86e36c99d66952cd6bcebeb7f)
Abstract:

The microencapsulation of l-menthol was studied by spray drying, using gum arabic (GA) and modified starch (CAPSUL, HI-CAP 100) as capsule materials. The results showed a higher retention of l-menthol with the increasing of initial solid concentration. HI-CAP 100, showed a higher retention than the other capsule materials. However, it also showed a higher residue of l-menthol on the surface of powder especially at the high concentration of l-menthol in the feed emulsion. That might be from the interaction between the wall materials and l-menthol which can re-crystallize to form whisker after the spray drying. Furthermore, the release characteristics of l-menthol were also investigated. The release rate increased upon elevation of relative humidity and temperature. The activation energies of the release of l-menthol from GA wall matrices at 75 and 83%RH were 140 and 48 kJ/mol, respectively.Industrial relevance
Controlled release of food constituents is currently receiving highest interest. This study aimed to better understand some of the processing and storage conditions. Decrease in emulsion droplet size led to increased flavor retention during spray drying. Interesting electron-micrographs of the spray dried capsules are provided as well as data on water absorption isotherms and release rate constants vs. storage temperatures. Clear industrially relevent data regarding capsule size, matrix, material, water activity and temperature during storage are provided.
Keywords: Spray drying; Encapsulation; Release; l-Menthol

Sascha Baur, Ralph Klaiber, Hua Wei, Walter Peter Hammes, Reinhold Carle, Effect of temperature and chlorination of pre-washing water on shelf-life and physiological properties of ready-to-use iceberg lettuce, Innovative Food Science & Emerging Technologies, Volume 6, Issue 2, June 2005, Pages 171-182, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.02.002.
(http://www.sciencedirect.com/science/article/B6W6D-4FTS30Y-1/2/6dc7d8935515d273a846e463fd5294db)
Abstract:
The effects of cold and warm, chlorinated water as well as warm water without chlorination for pre-washing trimmed, cored iceberg lettuce heads was assessed regarding the shelf-life and physiological properties of the resulting ready-to-use (RTU) produce. On a pilot-plant scale, lettuce heads were shredded with or without pre-washing (50 [degree sign]C, no chlorine; 4 and 50 [degree sign]C, 200 mg/l free chlorine; 60 s). After shredding, lettuce was washed for 90 s (tap water, 4 [degree sign]C), spin-dried, packaged in 200 g consumer-sized bags, and stored at 4 [degree sign]C for <= 9 days. Samples were analyzed for their headspace O2 and CO2 levels, sensory properties, microbiological status, and phenylalanine ammonia-lyase (PAL) activity at regular intervals throughout processing and storage. Parallelly, instrumental color and texture measurements were performed. All pre-washing procedures of lettuce heads lowered the initial counts of total aerobic bacteria, pseudomonades, and Enterobacteriaceae by >= 1.63, >= 1.55, and >= 1.85 log10 cfu/g, respectively, while the single-wash of shredded lettuce in tap water without any pre-washing resulted in significantly smaller reduction rates (0.23, 0.11, and 0.71 log10 cfu/g, respectively). During storage, all pre-washing procedures had a persistent effect on bacterial counts of the RTU lettuce. Furthermore, all pre-washing procedures delayed vascular tissue browning at cut edges and retarded the decline in the overall visual quality of the samples. Whereas wound-induced PAL synthesis was reduced by the use of warm water (+/- chlorine), O2 depletion and CO2 evolution in the corresponding bags were slightly enhanced, thus proving that processing kept the food as a living tissue.Industrial relevance
Ready to use fresh like produce is getting increasing attention and industrial relevance. The aim of this study was to specifically overcome problems associated with product heterogeneity. Interestingly, the use of warm tap water without chlorination as a pre-washing step proved as effective alternative to the application of cold chlorinated water without substantially compromising vitality and freshness of the product.

Keywords: Iceberg lettuce (Lactuca sativa L.); Ready-to-use; Fresh-cut; Minimal processing; Pre-washing; Chlorine; Warm water; Sensory and microbiological quality; Phenylalanine ammonia-lyase

Markus R. Mo[ss]hammer, Florian C. Stintzing, Reinhold Carle, Development of a process for the production of a betalain-based colouring foodstuff from cactus pear, Innovative Food Science & Emerging Technologies, Volume 6, Issue 2, June 2005, Pages 221-231, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.02.001.
(http://www.sciencedirect.com/science/article/B6W6D-4G0M3TW-1/2/d449fdebae2afd52029b52359fb3653b)
Abstract:
Since no process has yet been established for the production of cactus pear juice, the present work aimed at the development of a betalain-based colouring foodstuff from Opuntia ficus-indica cv. `Gialla' and cv. `Rossa' of two seasons applying unit operations typical for fruit juice production. Complete separation of the peels from the pulp and removal of seeds were achieved by carborundum peeling of the frozen fruits and subsequent passing through a finisher. Furthermore, for improved filtration of cactus pear juice different enzyme preparations were tested to degrade pectic-like substances. To monitor quality changes in the course of processing, juice samples were analysed after each processing step in terms of colour and selected chemical parameters. While lightness (L*) and chroma (C*) increased during processing for both cultivars, hue angle (h[degree sign]) remained unchanged for the yellow cultivar `Gialla', but a slight shift towards red was observed for the red cultivar `Rossa' after pasteurisation. Unexpectedly, even after repeated thermal treatment neither non-enzymatic browning nor HMF formation was observed in juices from both cultivars.Industrial relevance
Cactus pear represents a viable alternative to red beet for food colouring purposes: it neither exhibits negative sensorial impact nor high nitrate levels, but offers a broad colour range. However, no attempt has yet been made to benefit from this potential. The process developed is considered suitable for being scaled up to industrial-scale production thus opening an avenue for large-scale cactus pear fruit processing.
Keywords: Cactus pear juice; Opuntia ficus-indica; Betalains; Colouring foodstuff; Natural colourants

Jose Gomez, Marta Pazos, Susana Rodri'guez Couto, M Angeles Sanroman, Chestnut shell and barley bran as potential substrates for laccase production by Coriolopsis rigida under solid-state conditions, Journal of Food Engineering, Volume 68, Issue 3, June 2005, Pages 315-319, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.06.005.
(http://www.sciencedirect.com/science/article/B6T8J-4D2WMG0-1/2/c91ed48e57b76327a036bf0da9340d8e)
Abstract:
The potential of two lignocellulosic wastes chestnut shell and barley bran for laccase production by the white-rot fungus Coriolopsis rigida under solid-state conditions was assessed. These materials were selected due to their availability and low cost, since they are by-products of the food processing industries abundant in most countries. Barley bran gave the highest laccase activities, showing a maximum value of 3 [middle dot] 105 nkat/L, which was around 25-fold higher than the value attained in the chestnut shell cultures. In addition, the ability to degrade three structurally different dyes (Indigo Carmine, Methyl Orange and Methyl Green) by the extracellular liquid from the barley bran copper-supplemented cultures (1 mM) was analysed. Nearly complete decolourization was obtained for the dyes Indigo Carmine and Methyl Green, whereas Methyl Orange showed more resistance to decolourization.
Keywords: Barley bran; Chestnut shell; Coriolopsis rigida; Food processing industry; Laccase; Solid-state fermentation

Margaretha Jagerstad, Vieno Piironen, Caroline Walker, Gaspar Ros, Emilia Carnovale, Marie Holasova, Heinz Nau, Increasing natural food folates through bioprocessing and biotechnology, Trends in Food Science & Technology, Volume 16, Issues 6-7, EUROFOODFOLATE 2004, June-July 2005, Pages 298-306, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.03.005.
(http://www.sciencedirect.com/science/article/B6VHY-4G4MMHV-1/2/2bc698c46761da22144d8804ae3e4577)
Abstract:
The present study summarises results on processing effects for folates obtained from an EU-funded folate project (QLK1-1999-00576). Yeast fermentation, malting, germination and Lactobacillus bacteria can be combined and further optimised to potentially enhance the folate content in bread, vegetables, dairy products and beer by 2-3 fold. Further research, exploration and development of folate producing lactic acid bacteria and yeast strains for food applications should be encouraged. Milling technologies can be further developed and by careful selection of raw materials and ingredients, food processing can be designed and optimised to increase folate content (and specific forms) using minimal processing.

A. Amezquita, C.L. Weller, L. Wang, H. Thippareddi, D.E. Burson, Development of an integrated model for heat transfer and dynamic growth of Clostridium perfringens during the cooling of cooked boneless ham, International Journal of Food Microbiology, Volume 101, Issue 2, 25 May 2005, Pages 123-144, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.10.041.
(http://www.sciencedirect.com/science/article/B6T7K-4F6F6C2-3/2/96339fa7b2cda49f6531d2a1653a4467)
Abstract:
Numerous small meat processors in the United States have difficulties complying with the stabilization performance standards for preventing growth of Clostridium perfringens by 1 log10 cycle during cooling of ready-to-eat (RTE) products. These standards were established by the Food Safety and Inspection Service (FSIS) of the US Department of Agriculture in 1999. In recent years, several attempts have been made to develop predictive models for growth of C. perfringens within the range of cooling temperatures included in the FSIS standards. Those studies mainly focused on microbiological aspects, using hypothesized cooling rates. Conversely, studies dealing with heat transfer models to predict cooling rates in meat products do not address microbial growth. Integration of heat transfer relationships with C. perfringens growth relationships during cooling of meat products has been very limited. Therefore, a computer simulation scheme was developed to analyze heat transfer phenomena and temperature-dependent C. perfringens growth during cooling of cooked boneless cured ham. The temperature history of ham was predicted using a finite element heat diffusion model. Validation of heat transfer predictions used experimental data collected in commercial meat-processing facilities. For C. perfringens growth, a dynamic model was developed using Baranyi's nonautonomous differential equation. The bacterium's growth model was integrated into the computer program using predicted temperature histories as input values.
For cooling cooked hams from 66.6 [degree sign]C to 4.4 [degree sign]C using forced air, the maximum deviation between predicted and experimental core temperature data was 2.54 [degree sign]C. Predicted C. perfringens growth curves obtained from dynamic modeling showed good agreement with validated results for three different cooling scenarios. Mean absolute values of relative errors were below 6%, and deviations between predicted and experimental cell counts were within 0.37 log10 CFU/g. For a cooling process which was in exact compliance with the FSIS stabilization performance standards, a mean net growth of 1.37 log10 CFU/g was predicted. This study introduced the combination of engineering modeling and microbiological modeling as a useful quantitative tool for general food safety applications, such as risk assessment and hazard analysis and critical control points (HACCP) plans.

Keywords: Clostridium perfringens; Heat transfer; Finite element analysis; Dynamic growth model; Meat cooling

D. Thevenot, M.L. Delignette-Muller, S. Christieans, C. Vernozy-Rozand, Fate of Listeria monocytogenes in experimentally contaminated French sausages, International Journal of Food Microbiology, Volume 101, Issue 2, 25 May 2005, Pages 189-200, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.11.006.
(http://www.sciencedirect.com/science/article/B6T7K-4FG4BC3-3/2/7429bc86214486308fad98d3ddef48bd)
Abstract:
Listeria monocytogenes has been recognized as one of the most important foodborne pathogens dealt with by the food. The bacterium has been found in every part along the pork processing industry from the slaughterhouse to the cutting room and the delicatessen factories. During the fermentation and drying of sausages, L. monocytogenes tends to decrease substantially. However, despite the various hurdles in the dry sausage manufacturing process, L. monocytogenes is able to survive and is detected in the final products. The present study has evaluated growth and survival of eight different L. monocytogenes strains (originating from sausage, sausage industry environment and from clinical cases of listeriosis) in experimentally inoculated French sausages with 104 cfu g-1. This study points out the fact that the decrease of L. monocytogenes contamination rate during the manufacturing process of sausages is strain dependent ($p<0.001$) and mainly due to the drying and maturation step than to the fermentation itself. Whatever the strains studied, almost no decrease of the contamination rate was noted during the fermentation step. However hurdle-adapted strains (those isolated from sausages or sausage industry environment) were more difficult to cure from sausages (decrease by 1.5 log10) than non-adapted strains (decrease by 3 log10) at the end of the drying period (day 35), when sausages were ready for consumption. These sausages became safe only at the best before date. As a consequence, L. monocytogenes and more particularly those 'adapted' strains might represent a very important issue for hygienists since these strains originating from sausages or production environment themselves are likely to contaminate sausages during manufacturing and remain in the final products.
However, the high inoculum levels used in the study (104 cfu g-1) are not representative of the natural contamination of L. monocytogenes commonly encountered in the raw material for sausages. If such contamination happened to be inferior to 100 cfu g-1, then the manufacturing process used in this study would be able to produce 'safe' sausages according to the European regulation requiring the absence of L. monocytogenes in 25 g of food with a tolerance of below 100 cfu g-1 at the best before date.
Keywords: Growth; Survival; Activity water; Hurdle-adapted strains

Klaus Fischer, Hans-Peter Bipp, Generation of organic acids and monosaccharides by hydrolytic and oxidative transformation of food processing residues, Bioresource Technology, Volume 96, Issue 7, May 2005, Pages 831-842, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.07.003.
(http://www.sciencedirect.com/science/article/B6V24-4DCMHT4-1/2/f135047b6cd9f538557f4cbcc1151850)
Abstract:
Carbohydrate-rich biomass residues, i.e. sugar beet molasses, whey powder, wine yeast, potato peel sludge, spent hops, malt dust and apple marc, were tested as starting materials for the generation of marketable chemicals, e.g. aliphatic acids, sugar acids and mono-/disaccharides. Residues were oxidized or hydrolyzed under acidic or alkaline conditions applying conventional laboratory digestion methods and microwave assisted techniques. Yields and compositions of the oxidation products differed according to the oxidizing agent used. Main products of oxidation by 30% HNO_3 were acetic, glucaric, oxalic and glycolic acids. Applying H_2O_2/CuO in alkaline

solution, the organic acid yields were remarkably lower with formic, acetic and threonic acids as main products. Gluconic acid was formed instead of glucaric acid throughout. Reaction of a 10% H2O2 solution with sugar beet molasses generated formic and lactic acids mainly. Na2S2O8 solutions were very inefficient at oxidizing the residues.
Glucose, arabinose and galactose were formed during acidic hydrolysis of malt dust and apple marc. The glucose content reached 0.35 g per gram of residue.
Important advantages of the microwave application were lower reaction times and reduced reagent demands.
Keywords: Food processing residues; Hydrolysis; Microwave digestion; Aliphatic acids; Hydroxy carboxylic acids; Monosaccharides

Bektas Tepe, Munevver Sokmen, H. Askin Akpulat, Atalay Sokmen, In vitro antioxidant activities of the methanol extracts of four Helichrysum species from Turkey, Food Chemistry, Volume 90, Issue 4, May 2005, Pages 685-689, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.04.030.
(http://www.sciencedirect.com/science/article/B6T6R-4CSYN16-9/2/28ad1a99920108706dd47bf9b84bc42f)
Abstract:
This study was designed to examine the in vitro antioxidant activities of the methanol extracts of four Helichrysum species (Helichrysum noeanum Boiss., H. chionophilum Boiss. & Bal., H. plicatum DC. subsp. plicatum, H. arenarium (L.) Moench. subsp. aucheri (Boiss.) Davis & Kuphicha). The extracts were screened for their possible antioxidant activitiy by two complementary test systems, namely DPPH free radical-scavenging and [beta]-carotene/linoleic acid systems. In the first case, non-polar subfractions of the methanol extracts of Helichrysum species studied did not show any antioxidant activity, while the most active one was H. chionophilum (IC50 =40.5 [mu]g/ml) among the polar subfractions. In the [beta]-carotene/linoleic acid test system, inhibition rates of the oxidation of linoleic acid of H. noeanum and H. arenarium were very close to each other. The inhibition rate of the synthetic antioxidant BHT was determined to be 96%. Since the polar extracts of Helichrysum species dealt with here exhibited interesting antioxidant activities when compared to BHT, we believe that it would be useful to take the results into consideration as an alternative for food processing industries.
Keywords: Helichrysum; Antioxidant activity; DPPH; [beta]-Carotene/linoleic acid test

S. Dauphas, N. Mouhous-Riou, B. Metro, A.R. Mackie, P.J. Wilde, M. Anton, A. Riaublanc, The supramolecular organisation of [beta]-casein: effect on interfacial properties, Food Hydrocolloids, Volume 19, Issue 3, Food Colloids 2004 (Harrogate), May 2005, Pages 387-393, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2004.10.005.
(http://www.sciencedirect.com/science/article/B6VP9-4DX27W8-1/2/745e422f9eec8c92438fb464003505fc)
Abstract:
Milk caseins are natural emulsifiers widely used in food processing applications. Four different caseins exist in milk. [beta]-Casein is one of the most soluble, although not completely so. This protein can exist in solution in a molecular or aggregated state depending on concentration, temperature and calcium content. Many laboratory studies use [beta]-casein assuming it is in the molecular state, without verifying its exact state of aggregation. The aim of this work was to characterise the conditions required to obtain different [beta]-casein aggregation levels and to study their effect on interfacial properties. Different aggregation states have been obtained by varying [beta]-casein concentration, temperature and calcium content and characterised with dynamic light scattering, confocal microscopy and fluorescence spectroscopy. Four aggregation states of [beta]-casein (1 g/L) have been studied: a molecular state (7-8 nm), a micellar state (20-25 nm), a polymeric state (20-25 nm) and an aggregated state (>1 [mu]m). Their interfacial properties at the air-water interface have been followed in dynamic conditions through isotherms,

using a Langmuir film balance. We showed that ionic bridging had little impact on [beta]-casein interfacial properties. In contrast, the hydrophobic interactions were more significant in defining the adsorbed film structure. Thermal aggregation in solution was found to be totally reversible, whereas the changes seen in the surface film were not reversible. The interfacial film structure present at 35 [degree sign]C was independent of whether the film had been spread at 35 [degree sign]C from a preheated solution or spread at 15 [degree sign]C and then heated to 35 [degree sign]C. This was not the case for the structure present at 15 [degree sign]C.
Keywords: [beta]-Casein; Supramolecular organisation; Air-water interface; Temperature; Calcium; Reversibility

Lydia Campbell, Vassilios Raikos, Stephen R. Euston, Heat stability and emulsifying ability of whole egg and egg yolk as related to heat treatment, Food Hydrocolloids, Volume 19, Issue 3, Food Colloids 2004 (Harrogate), May 2005, Pages 533-539, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2004.10.031.
(http://www.sciencedirect.com/science/article/B6VP9-4F1J91H-1/2/1c3558192343e35bc45bb1fceea1168b)
Abstract:
Egg proteins are extensively utilised in many food products due to their unique functional properties. Some of the egg proteins are particularly sensitive to heat treatment and that can be a limitation to the processing of egg containing products. Suspensions of whole egg and egg yolk were heated at various temperatures in the presence of variable concentrations of sugar and salt. It was shown that egg proteins can withstand severe heat treatments when sugar and salt are present during the process. Depending on the sugar and salt concentrations, whole egg and egg yolk suspensions can be heated at temperatures as high as 80 [degree sign]C (2 min). Sugar and to a higher extent salt had an impact in delaying the denaturation of egg proteins and thus, increased heat stability. The effects of this heat treatment on the emulsifying properties of egg proteins were investigated for a range of protein content levels. Our results indicate that despite the severe heat treatment the egg proteins heated in the presence of sugar and salt were still capable of forming and stabilising emulsions. The sugar and salt concentrations present during the heating process, under specific temperature-time conditions, are correlated with the ionic strength of the solution and the degree of denaturation of the egg proteins, which in turn determine the adsorption capacities of the latter to the interfacial film.
Keywords: Oil-in-water emulsion; Heat stability; Egg proteins; Emulsifying ability; Sugar and salt concentrations

T. Hartmann, C. Theuring, T. Beuerle, N. Klewer, S. Schulz, M.S. Singer, E.A. Bernays, Specific recognition, detoxification and metabolism of pyrrolizidine alkaloids by the polyphagous arctiid Estigmene acrea, Insect Biochemistry and Molecular Biology, Volume 35, Issue 5, May 2005, Pages 391-411, ISSN 0965-1748, DOI: 10.1016/j.ibmb.2004.12.010.
(http://www.sciencedirect.com/science/article/B6T79-4FCRC62-5/2/2c70f639ab7f5f9902016630f1da44b2)
Abstract:
Evidence is presented that the polyphagous arctiid Estigmene acrea is well adapted to sequester and specifically handle pyrrolizidine alkaloids of almost all known structural types representative of the major plant families with pyrrolizidine alkaloid-containing species, i.e. Asteraceae with the tribes Senecioneae and Eupatorieae, Boraginaceae, Fabaceae, Apocynaceae and Orchidaceae. The adaptation of E. acrea to pyrrolizidine alkaloids includes a number of specialized characters: (i) highly sensitive recognition of alkaloid sources by pyrrolizidine alkaloid-specific taste receptors; (ii) detoxification of pyrrolizidine alkaloids by N-oxidation catalyzed by a specific flavin-dependent monooxygenase; (iii) transfer and maintenance of all types of pyrrolizidine N-oxides through all developmental stages; (iv) conversion of the various structures into the male courtship pheromone

hydroxydanaidal most probably through retronecine and insect specific retronecine esters (creatonotines) as common intermediates; (v) specific integration into mating behavior and defense strategies. Toxic otonecine derivatives, e.g. the senecionine analogue senkirkine, which often accompany the common retronecine derivatives and which cannot be detoxified by N-oxidation do not affect the development of E. acrea larvae. Senkirkine is not sequestered at all. Non-toxic 1,2-saturated platynecine derivatives that frequently occur together with toxic retronecine esters are sequestered and metabolized to hydroxydanaidal, indicating the ability of E. acrea to aromatize saturated pyrrolizidines. Although pyrrolizidine alkaloids, even if they are offered continuously at a high level (2%) in the larval diet, are non-toxic, E. acrea larvae are not able to develop exclusively on a pyrrolizidine alkaloid-containing plant like Crotalaria. Therefore, E. acrea appears to be specifically adapted to exploit pyrrolizidine alkaloid-containing plants as 'drug source' but not as a food source.
Keywords: Estigmene acrea (Lepidoptera; Arctiidae); Pyrrolizidine alkaloids; Alkaloid sequestration; Alkaloid processing; Hydroxydanaidal; Pheromone; Chemical defense; Taste receptor

Michelle K. Bull, Melinda M. Hayman, Cynthia M. Stewart, Elizabeth A. Szabo, Stephen J. Knabel, Effect of prior growth temperature, type of enrichment medium, and temperature and time of storage on recovery of Listeria monocytogenes following high pressure processing of milk, International Journal of Food Microbiology, Volume 101, Issue 1, 1 May 2005, Pages 53-61, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.10.045.
(http://www.sciencedirect.com/science/article/B6T7K-4F6MDDX-2/2/160a6661d7fbe003ed4c24f6046880d8)
Abstract:
A five-isolate cocktail of Listeria monocytogenes (103 cfu/ml in skim or whole raw milk) was subjected to 450 MPa for 900 s or 600 MPa for 90 s. The effects of prior growth temperature, type of milk (skim vs. whole), type of recovery-enrichment media (optimized Penn State University [oPSU] broth, Listeria Enrichment Broth [LEB], Buffered LEB [BLEB], Modified BLEB [MBLEB], and milk), storage temperature and storage time on the recovery of L. monocytogenes were examined. Optimized PSU broth significantly increased the recovery of L. monocytogenes following high pressure processing (HPP), and was 63 times more likely to recover L. monocytogenes following HPP, compared to LEB, BLEB and MBLEB broths ($p<0.05$; Odds Ratio=63.09, C.I. 23.70-167.96). There was a significant main effect for prior growth temperature ($p<0.05$). However, this relationship could not be interpreted given the significant interaction effects between temperature and both pressure and milk type. HPP-injured L. monocytogenes could be recovered using both LEB and oPSU broths after storage of milk at 4, 15 and 30 [degree sign]C, with recovery being maximal after 24 to 72 h of storage; however, recovery yield dropped to 0% after prolonged storage of milk at 4 and 30 [degree sign]C. In contrast, storage of milk at 15 [degree sign]C yielded the most rapid rate of recovery and the highest recovery yield (100%), which remained high throughout the 14 days of storage at 15 [degree sign]C. The above factors need to be taken into consideration when designing challenge studies to insure complete inactivation of L. monocytogenes and possibly other foodborne pathogens during high pressure processing of foods.
Keywords: High pressure processing; Listeria monocytogenes; Growth temperature; Recovery; Enrichment broths; Milk

B. Borck, K. Pedersen, Pulsed-field gel electrophoresis types of Campylobacter spp. in Danish turkeys before and after slaughter, International Journal of Food Microbiology, Volume 101, Issue 1, 1 May 2005, Pages 63-72, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.10.044.
(http://www.sciencedirect.com/science/article/B6T7K-4F60NFW-2/2/323bce8c61c9037c8c84a0027a643d08)

Abstract:
In this study, seven Danish turkey flocks were investigated at the farm, on arrival to the slaughterhouse, and during and after slaughter. Flocks were selected based on their Campylobacter spp. status at the farm and three Campylobacter negative and four Campylobacter positive flocks were included in the study. At the slaughterhouse, 70-75 samples were collected at different points from the shackling station to packaging of the final meat cuttings. Samples included cloacal swabs, neckskin, liver, heart, meat and environmental samples. Detection of Campylobacter . was carried out by conventional culture and by the EiaFoss system (Foss Electric, Hilleroed, Denmark) for detecting Campylobacter spp. in food, using Preston Broth as enrichment medium. The two methods were compared and sensitivities and specificities were calculated using the conventional culture as gold standard. The three negative flocks were consistently negative from the farm and all through processing. Among the samples from the positive flocks, the frequency of positive samples obtained at the slaughterhouse varied. The frequency of positive samples obtained from the four positive flocks varied and was found to be 4%, 49%, 87% and 96%, respectively. In 31 out of 424 samples, discrepancies were observed between results obtained by the EiaFoss system and the conventional culture technique. The sensitivity for the EiaFoss system was calculated to be 0.94 for meat and neckskin samples. A total of 161 strains were genotyped by pulsed-field gel electrophoresis (PFGE) in order to investigate possible changes in carriage of Campylobacter spp. strains during processing. In three flocks, only one PFGE type was encountered in samples collected at the farm level and, in one flock, two different types were observed. In two flocks, the strain from the farm was also isolated in samples collected at the slaughterhouse. Changes in carriage were observed in two flocks during processing, in particular post chilling.
Keywords: Campylobacter spp.; C. jejuni; C. coli; Turkeys; EiaFoss; Preston Broth; PFGE

Valeria Terzi, Caterina Morcia, Antonio Gorrini, A. Michele Stanca, Peter R. Shewry, Primetta Faccioli, DNA-based methods for identification and quantification of small grain cereal mixtures and fingerprinting of varieties, Journal of Cereal Science, Volume 41, Issue 3, May 2005, Pages 213-220, ISSN 0733-5210, DOI: 10.1016/j.jcs.2004.08.003.
(http://www.sciencedirect.com/science/article/B6WHK-4DM29YF-1/2/33bffdf268e8da2adae211fc19e4028b)
Abstract:
The composition of cereal-based foods is a key factor in determining the quality and safety of the final product while the reliable identification of cereal species and cultivars are essential for the handling, marketing and processing of grain and for the protection of plant breeders' rights. Analytical methods have therefore been developed and applied to identify and quantify cereal species in food products and also to fingerprint and identify grain at the genotype and variety levels. DNA-based methods for the detection and quantification of mixtures of small grain cereals are reviewed, together with the recent development of molecular markers for varietal fingerprinting.
Keywords: Variety; Detection methods; Fingerprinting; Real time PCR; Molecular markers

O. Rouaud, M. Havet, Numerical investigation on the efficiency of transient contaminant removal from a food processing clean room using ventilation effectiveness concepts, Journal of Food Engineering, Volume 68, Issue 2, May 2005, Pages 163-174, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.029.
(http://www.sciencedirect.com/science/article/B6T8J-4CTN4R9-3/2/ea8cc80050c37c143dd1db5e2171f930)
Abstract:
Clean rooms are widely used in food-processing industries to guarantee the quality of food products. To maintain the desired cleanliness class in these large and complex enclosures, high ventilation rates are usually used. The recommended air change rates, based on empirical

formulas, generate large energy consumptions and do not always guarantee the desired cleanliness class. The objective of this work is to provide a new methodology to properly design the air distribution in clean rooms and to optimise the process arrangement. A complete numerical study is made on the efficiency of transient contaminant removal from a full scale clean room intended for food manufacturing. We combine CFD simulations with the calculation of selected ventilation criteria. The contaminant removal effectiveness and the mean age of air permit to optimise the contaminant source position and to determine decontamination time respectively. These numerical results corroborate previous experimental observations and can lead to new recommendations.
Keywords: Clean room; Cleanliness class; Air change rate; Contaminant removal effectiveness; CFD

Isabelle Lebert, Philippe Baucour, Andre Lebert, Jean-Dominique Daudin, Assessment of bacterial growth on the surface of meat under common processing conditions by combining biological and physical models, Journal of Food Engineering, Volume 68, Issue 1, May 2005, Pages 89-98, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.026.
(http://www.sciencedirect.com/science/article/B6T8J-4CX15SC-3/2/e1818ed0255eaf2ad51ead7470c4c147)
Abstract:
A water transfer model and a bacterial model were combined to study the effects of process parameters (air temperature, velocity and relative humidity (RH)) on the drying of the food surface and their indirect consequences on bacterial growth. They were tested on experimental growths of Pseudomonas spp. inoculated on pork meat: small variations in a parameter can have a considerable effect on bacterial growth. Sensitivity calculations showed how the meat properties (diffusivity, sorption isotherm, thickness) affected the calculated results. The combined models were applied to study the impact of air velocity and RH on the increase in the bacterial population after 96 h of storage at 12 [degree sign]C. Thus, no more than a two log unit increase is obtained (1) if the air velocity is equal to 0.2 m/s and RH below 82% or (2) if RH is as high as 90%, air velocity must be equal to 0.9 m/s.
Keywords: Surface water activity; Predictive microbiology; Meat; Water mass transfer; Modelling

M.A. Ruiz-Cabrera, L. Foucat, J.M. Bonny, J.P. Renou, J.D. Daudin, Assessment of water diffusivity in gelatine gel from moisture profiles. II. Data processing adapted to material shrinkage, Journal of Food Engineering, Volume 68, Issue 2, May 2005, Pages 221-231, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.034.
(http://www.sciencedirect.com/science/article/B6T8J-4CXMT8M-1/2/f80ba6fe9c187a02ca2b18f5f48582c2)
Abstract:
A method to assess the relationship between water diffusivity and water content was developed. Experiments designed to promote isothermal and unidirectional drying of samples and calculations of 1D water content profiles from 2D NMR images were presented in Part I (Ruiz-Cabrera et al., 2005).
In theory water content profiles in rigid materials at different drying times can form a unique `master curve' when Boltzmann's transformation is applied and the relationship D = f(X) can be directly derived from this curve. A procedure is proposed to account for local shrinking due to water removal: the measured water content profiles are first transposed into Lagrangian coordinates so that they correspond to the dry matter. This procedure was applied to the 1D profiles already measured on gelatine gel samples whose initial moisture content, pH and temperature were in the ranges 1.8-5 kg/kg dry basis, 4-8 and 10-24 [degree sign]C, respectively.
The assessed water diffusivity strongly decreased with the decrease in water content and slightly increased with temperature increase. The closer the pH is to the isoelectric point, the lower the

water diffusivity. A unique relationship between water diffusivity and water content was not found. Regardless of the initial water content, the initial water diffusivity is always close to that of pure water. This suggests that structure changes induced by shrinking are a determining factor and that water content is just an indirect means of referring to that effect.
Keywords: Water diffusivity; Food; Boltzmann's transformation; Drying; Mass transfer

Ferruh Erdogdu, Mathematical approaches for use of analytical solutions in experimental determination of heat and mass transfer parameters, Journal of Food Engineering, Volume 68, Issue 2, May 2005, Pages 233-238, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.038.
(http://www.sciencedirect.com/science/article/B6T8J-4CTTKV0-2/2/6f2d660e82bc52c610782ca520d9e407)
Abstract:
Heat (heat transfer coefficient and thermal diffusivity values) and mass (mass transfer coefficient and diffusion coefficient values) transfer parameters are crucially important for characterization and modeling of food processing operations. Since they are important function and property of interested material and medium itself, experimental determination of these values would be valuable. Analytical solutions for regular geometries (infinite slab, infinite cylinder and sphere) have a broad use in experimentally determining these parameters. These solutions, with use of experimental data, might give a greater advantage over use of other methods, e.g. the lumped system approach or empirical equations. Effective use of numerical solution techniques with experimental data would enable simultaneous determination of the related parameters with the experimental data. The experimental data and the analytical solutions may also be used to determine the thermocouple locations to use in the model validation studies. This technique would be much faster and easier compared to the other methods used for this objective.
Keywords: Analytical solutions; Heat and mass transfer parameters

Barth W. Wright, Craniodental biomechanics and dietary toughness in the genus Cebus, Journal of Human Evolution, Volume 48, Issue 5, May 2005, Pages 473-492, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2005.01.006.
(http://www.sciencedirect.com/science/article/B6WJS-4FWKDP5-1/2/2da1e38bdf7ff3521c09ce0a1bfb12ea)
Abstract:
The tufted capuchin (Cebus apella) has been used in a number of comparative studies to represent a primate with craniofacial morphology indicative of hard-object feeding. Researchers have specifically referred to the tufted capuchin as a seed predator. Craniofacial features exhibited by the tufted capuchin, such as thick cortical bone in the mandibular corpus and symphysis, and a broad face associated with large masticatory muscles, permit the production and dissipation of relatively high masticatory forces. These morphologies, however, cannot distinguish between the tufted capuchin's propensity to exert higher forces when opening food with its anterior dentition or with its cheek teeth. It is also unclear whether these are adaptations for biting or chewing foods. This study uses a constrained lever model to compare the masticatory adaptations of C. apella to other cebids and atelids. Results show that the temporalis and masseter muscles in C. apella and C. olivaceus are more anteriorly positioned relative to nine other platyrrhine taxa. This condition, which appears to be ancestral among the Cebinae, increases force production at the incisors and canines while compromising third molar function. Cebus apella, has exaggerated this pattern. Field data on dietary toughness show that both capuchins typically select foods of low toughness, but on occasion, C. apella ingests food items of exceptional toughness. Thus, C. apella appears to maintain these biomechanical relationships by producing particularly high but relatively infrequent bite forces, particularly at the incisors and canines. However, adaptations for anterior dental use do not tightly constrain the diet of Cebus apella. This approach can be used to clarify the dietary adaptations of fossil taxa.

Keywords: constrained lever model; dietary toughness; food processing; biological role; Platyrrhini

Liliane Ruess, Alexei Tiunov, Dominique Haubert, Hans H. Richnow, Max M. Haggblom, Stefan Scheu, Carbon stable isotope fractionation and trophic transfer of fatty acids in fungal based soil food chains, Soil Biology and Biochemistry, Volume 37, Issue 5, May 2005, Pages 945-953, ISSN 0038-0717, DOI: 10.1016/j.soilbio.2004.09.015.
(http://www.sciencedirect.com/science/article/B6TC7-4DXTJJS-3/2/d3f46494839c9e69fa7b7295fde8c36c)
Abstract:
Stable isotope analysis has been used as a powerful tool in food web studies in terrestrial ecosystems. In addition the occurrence and abundance of fatty acids may serve as indicator for feeding strategies of soil animals. Here we combine both approaches and investigate the fatty acid composition, [delta]13C values of bulk tissues and individual fatty acids in soil organisms. The fungi Chaetomium globosum and Cladosporium cladosporioides were isotopically labelled by fructose derived from either C3 or C4 plants, and the fungal-feeding nematode Aphelenchoides sp. was reared on C. globosum. Fungi and nematodes were used as diet for the Collembolan Protaphorura fimata. The sugar source was fractionated differently by fungal lipid metabolism in a species-specific manner that points to a sensitivity of physiological processing to the non-random distribution of 13C/12C isotopes in the molecule. As a general trend stearic acid (18:0) was depleted in 13C compared to the precursor palmitic acid (16:0), whereas its desaturation to oleic acid (18:1 [omega]9) favoured the 13C-rich substrate.
Fatty acid profiles of P. fimata varied due to food source, indicating incorporation of dietary fatty acids into Collembolan tissue. Individuals feeding on fungi had lower amounts in C20 fatty acids, with monoenoic C20 forms not present. This pattern likely separates primary consumers (fungivores) from predators (nematode feeders). The isotopic discrimination in 13C for bulk Collembola ranged between -2.6 and 1.4[per mille sign] and was dependent on fungal species and C3/C4 system, suggesting differences at metabolic branch points and/or isotope discrimination of enzymes. Comparison of [delta]13C values in individual fatty acids between consumer and diet generally showed depletion (i.e. de novo synthesis) or no changes (i.e. dietary routing), but the fractionation was not uniform and affected by the type of ingested food. Fatty acid carbon isotopes were more variable than those of bulk tissues, likely due to both the distrimination by enzymes and the different lipid origin (i.e. neutral or polar fraction).
Keywords: Fatty acids; Carbon stable isotopes; Food web; Fungi; Collembola

Wendie L. Claeys, Kristel De Vleeschouwer, Marc E. Hendrickx, Quantifying the formation of carcinogens during food processing: acrylamide, Trends in Food Science & Technology, Volume 16, Issue 5, May 2005, Pages 181-193, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.01.005.
(http://www.sciencedirect.com/science/article/B6VHY-4FTS2W9-1/2/c64ca8d7fbc6f981f6c741f306804f7d)
Abstract:
The presence of acrylamide has recently been demonstrated in diverse food products. A number of research studies followed concerning the effect of intrinsic and extrinsic factors on the yield of AA in processed food. However, reported data are mainly qualitative in nature, which does not allow the development of engineering models for design, evaluation and optimization of food processes. In this paper, the need for more quantitative research (kinetic and thermodynamic modeling) is emphasized by outlining a possible strategy based on a state of the art of research results available in literature.

Y. Estrada-Giron, B.G. Swanson, G.V. Barbosa-Canovas, Advances in the use of high hydrostatic pressure for processing cereal grains and legumes, Trends in Food Science & Technology, Volume 16, Issue 5, May 2005, Pages 194-203, ISSN 0924-2244, DOI: 10.1016/j.tifs.2004.10.005.

(http://www.sciencedirect.com/science/article/B6VHY-4G1R3PS-1/2/23346436adef37253c600a0871facd91)
Abstract:
On a world scale, cereal grains and legumes are the main source of calories in the human diet. They provide most of the energy needed and about 8% of the proteins and vitamins. Grains usually undergo some type of processing involving heat treatment, which improves digestibility and removes allergens.
Recent studies have demonstrated that under optimal conditions, high hydrostatic pressure (HHP), a promising nonthermal technology applied to food products, may inactivate the anti-nutritional factors of grains while preserving food quality and constituents. During HHP treatment, allergenic proteins from rice grains are solubilized, particularly the 7S globulins; while no apparent alteration in color, shape, or size of treated seeds occurs at moderate pressure. The vegetable protein in soybeans (tofu) is usually preserved if refrigerated under vacuum conditions; however, tofu subjected to HHP treatment has been shown to reduce microbial population while increasing protein digestibility. Other constituents of grains such as vitamin A are not significantly affected, while water soluble vitamins (B1, B6, and C) are well retained (85%). Other applications of HHP for cereals include wheat and barley flours, and activity of amylases. A further possibility of creating new textured products from doughs subjected to HHP is being studied as well.

Radhika K. Apaiah, Eligius M.T. Hendrix, Gerrit Meerdink, Anita R. Linnemann, Qualitative methodology for efficient food chain design, Trends in Food Science & Technology, Volume 16, Issue 5, May 2005, Pages 204-214, ISSN 0924-2244, DOI: 10.1016/j.tifs.2004.09.004.
(http://www.sciencedirect.com/science/article/B6VHY-4G2BG6R-1/2/ca3585a61a26becfec06f03dd878ff3f)
Abstract:
This paper presents a methodology to efficiently design food supply chains. The goals of quality, cost and environmental load are looked at independently of each other. Food chains are made up of links and are designed to deliver a particular product with consumer-specified attributes. These attributes are used to select the goals (quality, cost and environment load) to optimise the chain. The methodology presents a systematic way to identify problem areas in supply chains. The entire chain from primary production up to and including consumer processing influences the final product; but the relative contribution of the links varies according to the goal for which the chain is being designed and optimised. Case studies on a novel protein food made from pea protein are presented to showcase the methodology.

J.A. Funk, I.T. Harris, P.R. Davies, Comparison of fecal culture and Danish Mix-ELISA for determination of Salmonella enterica subsp. enterica prevalence in growing swine, Veterinary Microbiology, Volume 107, Issues 1-2, 25 April 2005, Pages 115-126, ISSN 0378-1135, DOI: 10.1016/j.vetmic.2005.01.006.
(http://www.sciencedirect.com/science/article/B6TD6-4FGXS5D-1/2/99fc12281a53f5f6bde68edba30a94a3)
Abstract:
In the USA, control of food-borne salmonellosis associated with meat consumption has been predominantly focused at slaughter and processing. It is expected that standards at slaughter and processing will become more stringent, creating pressure to reduce prevalence of Salmonella-positive food animals through on-farm interventions. The aim of this study was to compare traditional fecal culture and the Danish Mix-ELISA (DME) for determination of Salmonella prevalence pre-harvest in swine. In Trial 1, five cohorts of individually identified pigs were longitudinally sampled during the growing period to compare the kinetics of prevalence as estimated by fecal culture and the DME. In Trial 2, the correlation between fecal prevalence and seroprevalence was estimated pre-marketing in 49 groups of pigs. In Trial 1, fecal prevalence and

seroprevalence showed similar kinetics, with a tendency of a higher OD% cut-off to more closely approximate fecal prevalence. In Trial 2, correlations between fecal culture and the DME were 0.40, 0.36, 0.43, and 0.43 ($p < 0.001$) for OD% cut-offs >=10, 20, 30, and 40, respectively. Based on these results, a higher OD% cut-off would be recommended if more approximate estimation of fecal prevalence is desired and longitudinal sampling would be suggested for evaluating the impact of on-farm interventions for Salmonella reduction whether utilizing fecal culture or the DME. Further evaluation of the impact of Salmonella serovar present on farms on seroprevalence and the relationship of on-farm seroprevalence with food safety risk are needed prior to utilizing the DME for pre-harvest Salmonella diagnostics in the US swine herd.
Keywords: Salmonella enterica; Pig-bacteria; ELISA; Fecal culture

Christopher J. Doona, Florence E. Feeherry, Edward W. Ross, A quasi-chemical model for the growth and death of microorganisms in foods by non-thermal and high-pressure processing, International Journal of Food Microbiology, Volume 100, Issues 1-3, The Fourth International Conference on Predictive Modelling in Foods, 15 April 2005, Pages 21-32, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.10.005.
(http://www.sciencedirect.com/science/article/B6T7K-4F02M4H-2/2/18771170487704c92ba8b692ffe0d5f1)
Abstract:
Predictive microbial models generally rely on the growth of bacteria in laboratory broth to approximate the microbial growth kinetics expected to take place in actual foods under identical environmental conditions. Sigmoidal functions such as the Gompertz or logistics equation accurately model the typical microbial growth curve from the lag to the stationary phase and provide the mathematical basis for estimating parameters such as the maximum growth rate (MGR). Stationary phase data can begin to show a decline and make it difficult to discern which data to include in the analysis of the growth curve, a factor that influences the calculated values of the growth parameters. In contradistinction, the quasi-chemical kinetics model provides additional capabilities in microbial modelling and fits growth-death kinetics (all four phases of the microbial lifecycle continuously) for a general set of microorganisms in a variety of actual food substrates. The quasi-chemical model is differential equations (ODEs) that derives from a hypothetical four-step chemical mechanism involving an antagonistic metabolite (quorum sensing) and successfully fits the kinetics of pathogens (Staphylococcus aureus, Escherichia coli and Listeria monocytogenes) in various foods (bread, turkey meat, ham and cheese) as functions of different hurdles (aw, pH, temperature and anti-microbial lactate). The calculated value of the MGR depends on whether growth-death data or only growth data are used in the fitting procedure. The quasi-chemical kinetics model is also exploited for use with the novel food processing technology of high-pressure processing. The high-pressure inactivation kinetics of E. coli are explored in a model food system over the pressure (P) range of 207-345 MPa (30,000-50,000 psi) and the temperature (T) range of 30-50 [degree sign]C. In relatively low combinations of P and T, the inactivation curves are non-linear and exhibit a shoulder prior to a more rapid rate of microbial destruction. In the higher P, T regime, the inactivation plots tend to be linear. In all cases, the quasi-chemical model successfully fit the linear and curvi-linear inactivation plots for E. coli in model food systems. The experimental data and the quasi-chemical mathematical model described herein are candidates for inclusion in ComBase, the developing database that combines data and models from the USDA Pathogen Modeling Program and the UK Food MicroModel.
Keywords: Quasi-chemical kinetics model; Growth-death kinetics; Predictive microbial modeling; High-pressure processing; Escherichia coli; Staphyloccocus aureus; Listeria monocytogenes

Singgih Wibowo, Gonzalo Velazquez, Vivek Savant, J. Antonio Torres, Surimi wash water treatment for protein recovery: effect of chitosan-alginate complex concentration and treatment

time on protein adsorption, Bioresource Technology, Volume 96, Issue 6, April 2005, Pages 665-671, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.06.024.
(http://www.sciencedirect.com/science/article/B6V24-4D4PS9H-3/2/a7689c531bb4cb96a99bfc813e1364d4)
Abstract:
Chitosan (Chi), a protein recovery agent for the treatment of aqueous food processing streams, appears to work by mechanical entrapment and electrostatic interaction of chitosan amino groups with anionic groups on proteins. Chitosan effectiveness for recovering soluble proteins from surimi wash water (SWW) is increased by complexation with alginate (Alg) and by adjusting complex concentration and treatment time. Flocculation at 20 [degree sign]C with Chi-Alg at a 0.2 mixing ratio added as 20, 40, 100 and 150 mg/L SWW was aided by 5 min agitation at 130 rpm and then held at the same temperature for 30 min, 1 and 24 h. Turbidity measurements, protein determinations and qualitative FTIR analysis confirmed SWW protein adsorption which depended on Chi-Alg concentration and reaction time while turbidity reduction was affected by concentration only. No differences ($p < 0.05$) in protein adsorption were found between 1 and 24 h. Using 100 mg Chi-Alg complex/L SWW for 1 h achieved 83% protein adsorption and 97% turbidity reduction.
Keywords: Chitosan; Alginate; Surimi; Turbidity; Flocculation

Qiaofen Cheng, Da-Wen Sun, Amalia G.M. Scannell, Feasibility of water cooking for pork ham processing as compared with traditional dry and wet air cooking methods, Journal of Food Engineering, Volume 67, Issue 4, April 2005, Pages 427-433, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.011.
(http://www.sciencedirect.com/science/article/B6T8J-4CYNVNG-1/2/bff054b4cb4adc19a3f4cc56f0ad6a6a)
Abstract:
In order to study the feasibility of water cooking (82 [degree sign]C) in ham processing, cooking efficiency, texture, nutrition, sensory and microbial load of ham cooked in water were compared with those cooked in dry air at 120 [degree sign]C and wet air at 82 [degree sign]C. The results indicated that water cooking in low medium temperature could achieve the higher cooking efficiency as dry air cooking, and the yield of water cooking was significantly higher (99.06%) than those of the other two cooking methods ($P<0.05$). Water cooking produced compatible nutritional and textural results with wet air cooking, and trends of storage indicated lower microbial load after 21d than wet air cooking from the result of aerobic plate count ($P<0.05$). Sensory evaluation showed there were no difference rated by panellists in tenderness, juiciness, flavour, binding and acceptability among different methods cooked ham. However, the panellists preferred the colour of water cooked ham ($P<0.05$). This study showed that water cooking might provide a promising and alternative method to process pork ham with high yield and cooking efficiency, compatible nutritional and textural qualities.
Keywords: Pork ham; Cooking techniques; Texture; Nutrition; Quality; Air blast cooling; Food safety; Water cooking; Dry air cooking; Wet air cooking

O.J. Oyelade, P.O. Odugbenro, A.O. Abioye, N.L. Raji, Some physical properties of African star apple (Chrysophyllum alibidum) seeds, Journal of Food Engineering, Volume 67, Issue 4, April 2005, Pages 435-440, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.046.
(http://www.sciencedirect.com/science/article/B6T8J-4DR1PT7-1/2/b1830762900a87e1b1fba7d37fba85a5)
Abstract:
Basic physical properties of food crops that are often required in order to design production processes, equipment and evaluation of the effect of processing on nutrients were determined for African star apple seeds, at a moisture contents of 8.49% (dry basis). The average seed longitudinal, transverse and thickness dimensions were 24.1, 14.7 and 8.30 mm, respectively.

True density, bulk density and density ratio were 972.88, 499.61 kg m-3 and 51.58% respectively. However, static friction varied on three different surfaces from 0.38 to 0.51, while the angle of repose ranged from 13.01[degree sign] to 14.69[degree sign]. The specific heat of the whole seed and kernel were 129.40 and 155.08 kJ kg-1 K-1 respectively at 80 [degree sign]C.
Keywords: African star apple seed; Physical properties; Handling machineries; Thermal processing