Subjek : Teknologi Pangan
Tahun 2004-2008 (601 judul)

Charles M.A.P. Franz, Ingrid Specht, Gyu-Sung Cho, Volker Graef, Mario R. Stahl, UV-C-inactivation of microorganisms in naturally cloudy apple juice using novel inactivation equipment based on Dean vortex technology, Food Control, Volume 20, Issue 12, December 2009, Pages 1103-1107, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.02.010.
(http://www.sciencedirect.com/science/article/B6T6S-4VVXSTB-1/2/acd6561223e5eb07169f67652de2677b)
Abstract:
A novel UV-C irradiation device in laboratory scale was tested for its potential to inactivate bacteria in naturally cloudy apple juice. In this device, liquid flows through a helically wound tubing wrapped around a quartz glass tube containing a 9 W UV lamp with an irradiation intensity of 60 W/m2 at 254 nm. The equipment was capable of reducing numbers of inoculated Escherichia coli and Lactobacillus brevis from an initial concentration of approximately 106 CFU/ml or 104 CFU/ml to below detectable limits in commercial naturally cloudy apple juice at a flow rate of 2 l/h, and to well below 1 x 102 also at higher flow rates of 4 and 8 l/h. Numbers of Saccharomyces cerevisiae could be reduced from an initial level of ca. 1 x 104-1 x 102 CFU/ml or less at flow rates of 2 and 4 l/h. Although E. coli could be effectively inactivated also in self-extracted, as well as industrially processed apple juice, contaminating yeast and lactic acid bacteria were not completely eliminated.
Keywords: UV-C; Food irradiation; Bacteria and yeasts; Apple juice; Escherichia coli; Lactobacillus brevis; Saccharomyces cerevisiae; Dean vortex

Juliane Floury, Benedicte Camier, Florence Rousseau, Christelle Lopez, Jean-Pierre Tissier, Marie-Helene Famelart, Reducing salt level in food: Part 1. Factors affecting the manufacture of model cheese systems and their structure-texture relationships, LWT - Food Science and Technology, Volume 42, Issue 10, December 2009, Pages 1611-1620, ISSN 0023-6438, DOI: 10.1016/j.lwt.2009.05.026.
(http://www.sciencedirect.com/science/article/B6WMV-4WGK4R6-1/2/b3a4502225339a4125677e75b59462a6)
Abstract:
A model lipoproteic matrix able to mimic hard-type cheese was produced with controlled structural and textural properties. Changes in the microstructural and rheological properties of these model cheeses made from different milk concentrate powder, anhydrous milk fat, salt contents and pH values at renneting were characterised. Rheological properties were measured by texture profile analysis, fat globule and protein aggregate size distributions by laser light scattering. Microstructural properties of the model matrices were studied by confocal laser scanning and scanning electron microscopy.
Significant differences between the matrices were found for the structural, physico-chemical and rheological parameters measured. Cheeses with higher dry matter content were significantly harder and contained more insoluble proteins than cheeses with lower dry matter content. The salt concentration and the pH at renneting had significant influence on cheese hardness and adhesiveness of rheological parameters. The model lipoproteic matrix presented air bubbles and powder aggregates which could not be avoided during the manufacture of products. However, compared with classic cheese making with rennet or acid coagulation, the technology used here allows model cheeses to be produced rapidly with a good reproducibility of texture.
Keywords: Model cheese; Texture profile analysis; Structure properties; Microstructure

Juliane Floury, Olivier Rouaud, Maeva Le Poullennec, Marie-Helene Famelart, Reducing salt level in food: Part 2. Modelling salt diffusion in model cheese systems with regards to their composition, LWT - Food Science and Technology, Volume 42, Issue 10, December 2009, Pages 1621-1628, ISSN 0023-6438, DOI: 10.1016/j.lwt.2009.06.002.
(http://www.sciencedirect.com/science/article/B6WMV-4WH2M85-1/2/22766baae68740aac5be6c85b99a47e9)
Abstract:
In the first part of the paper (Floury, J., Camier, B. Rousseau, F., Lopez, C., Tissier, J. P., & Famelart, M. H. (2009) Reducing salt level in food: Part 1. controlled manufacture of model cheese systems and their structure-texture relationships. LWT - Food Science and Technology 49(10), 1611-1620), a model cheese matrix presenting different textural properties was developed in order to further study the factors implied in the salt release in mouth during food chewing. The present work consists in physical and modelling approaches to better understand the mass transfer phenomena occurring in the product during its consumption in the mouth. Concentration profiles of several ionic species were measured during the release of salt from the different model matrices into artificial saliva. Apparent diffusion coefficients of the sodium chloride were determined by fitting the experimental data to the second Fick's law. Apparent diffusion coefficients were included between 2.81 and 3.43 x 10-10 m2 s-1 at 15 [degree sign]C and 75% HR. D-value decreased strongly when the dry matter content decreased. Microstructure of the matrices with the lower protein concentration was coarser and fluffier, facilitating the diffusion of the solutes. The D-value increased with the pH at renneting, probably because of the chemical changes of the structure of the casein micelles and significant differences in textural characteristics of cheeses. The diffusion coefficient also significantly decreased with the initial salt concentration, due to the tightening of the matrix microstructure.
Keywords: Model cheese; Ionic species; Sodium chloride; Modelling; Mass transfer

Shelly Hogan, Lei Zhang, Janrong Li, Bruce Zoecklein, Kequan Zhou, Corrigendum to 'Antioxidant properties and bioactive components of Norton (Vitis aestivalis) and Cabernet Franc (Vitis vinifera) wine grapes' [LWT - Food Science and Technology 42 (2009) 1269-1274], LWT - Food Science and Technology, Volume 42, Issue 10, December 2009, Page 1755, ISSN 0023-6438, DOI: 10.1016/j.lwt.2009.05.001.
(http://www.sciencedirect.com/science/article/B6WMV-4WJ2CNV-1/2/878ede4026cede2ebef400b9ee936f66)

Dean O. Cliver, Disinfection of animal manures, food safety and policy, Bioresource Technology, Volume 100, Issue 22, OECD Workshop: Livestock Waste Treatment Systems of the Future: A Challenge to Environmental Quality, Food Safety, and Sustainability, November 2009, Pages 5392-5394, ISSN 0960-8524, DOI: 10.1016/j.biortech.2009.04.038.
(http://www.sciencedirect.com/science/article/B6V24-4W9S2R1-2/2/03603bbb043799a39ca9b8f21f35c4e8)
Abstract:
Manure is a resource, but sometimes also a nuisance. Manure management strategies have traditionally focused on soil nutrients (N, P, K), COD, and more recently biological substances (antibiotics, hormones, etc.), with disinfection being a relative afterthought. Zoonotic pathogens (Salmonella and other bacteria, protozoa, etc.) may be present in manure, but only occasionally cause foodborne disease. In countries where food is relatively safe, requiring heroic manure disinfection measures may be a net detriment to public health. Decisions that a new, elegant disinfection technology can, should, or must be done may result from invoking the 'precautionary principle.' Additional capital and operating costs must be passed to the consumer. Since such measures are likely to prevent very few human illnesses, policymakers should also consider the

effect of increased prices on human nutrition and hunger. In most situations, not eating is more dangerous than eating.
Keywords: Biodegradation; Disinfection; Foodborne disease; Manure; Zoonotic pathogens

Kang Huang, Jianping Wang, Designs of pulsed electric fields treatment chambers for liquid foods pasteurization process: A review, Journal of Food Engineering, Volume 95, Issue 2, November 2009, Pages 227-239, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.06.013.
(http://www.sciencedirect.com/science/article/B6T8J-4WHMMDF-2/2/c5a8af04e37e98c0f60406cc7b513915)
Abstract:
As a non-thermal pasteurization process, pulsed electric fields (PEF) technology has been receiving wide attention. This rapid process can provide consumers with microbiologically safe, minimally processed, fresh-like products. The treatment chamber, which houses electrodes and delivers a high voltage to a food material, is one of the key components in the PEF pasteurization process. This paper mentions the current designs of the PEF treatment chambers, reviewing various configurations of static and continuous-flow treatment chambers, the effect of basic design parameters, and the performance of the optimized treatment system based on the existent chambers.
Keywords: Pulsed electric field; Treatment chamber; Non-thermal process

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

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

I. Concina, M. Falasconi, E. Gobbi, F. Bianchi, M. Musci, M. Mattarozzi, M. Pardo, A. Mangia, M. Careri, G. Sberveglieri, Early detection of microbial contamination in processed tomatoes by electronic nose, Food Control, Volume 20, Issue 10, October 2009, Pages 873-880, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.11.006.
(http://www.sciencedirect.com/science/article/B6T6S-4V2NK9T-1/2/7cffd4f73522c02c8985bb23ae1f6c1d)
Abstract:
Microbial contamination can easily affect processed tomato, thus determining both organoleptic adulterations and potential health risks for customers. Innovative techniques for a rapid and reliable diagnose of spoilage, such as electronic nose technology, are highly requested in order to guarantee food safety and to improve production. In this work canned peeled tomatoes were artificially spoiled with different kinds of microbial flora and then were analyzed by means of an electronic nose based on thin film metal oxide gas sensors. Preliminary analyses by dynamic-headspace gas chromatographic-mass spectrometry showed significant differences in the semi-quantitative volatile compounds profile of spoiled tomato samples just after few hours from contamination, thus suggesting to employ the electronic nose for an early diagnose of microbial presence. The electronic nose was indeed able to reveal contamination, even at early stages depending on the type of contaminant (e.g. for Saccharomyces cerevisiae and Escherichia coli), and to recognize spoiled tomato samples with good classification performances.
Keywords: Tomato; Microbial spoilage; DHS-GC-MS; Electronic nose

Lars Wadso, Federico Gomez Galindo, Isothermal calorimetry for biological applications in food science and technology, Food Control, Volume 20, Issue 10, October 2009, Pages 956-961, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.11.008.
(http://www.sciencedirect.com/science/article/B6T6S-4V3HHFC-1/2/d93baafe59e2c8433f7e25ac468b26ab)
Abstract:
All physical, chemical and biological processes produce heat and isothermal calorimetry is a general measurement technique to study all kinds of processes by the heat they produce. This paper gives several examples of studies of biological processes in the food area using isothermal calorimetry. It is for example shown how different unit operations influence respiration of vegetable tissue, how the kinetics of a fermentation process can be studied, and how spoilage processes can be followed for shelf-life determinations.
Keywords: Isothermal calorimetry; Biology; Food science; Respiration; Fermentation; Spoilage; Shelflife

Kanokrat Limpisophon, Munehiko Tanaka, WuYing Weng, Shuji Abe, Kazufumi Osako, Characterization of gelatin films prepared from under-utilized blue shark (Prionace glauca) skin, Food Hydrocolloids, Volume 23, Issue 7, October 2009, Pages 1993-2000, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2009.03.014.
(http://www.sciencedirect.com/science/article/B6VP9-4W0SK4X-2/2/4b4711e8a964f4f88fefb4ee8d89c799)
Abstract:
Gelatin film from blue shark (Prionace glauca) skin was investigated in order to utilize what is one of the most serious marine wastes in Japan. Film properties from shark skin such as tensile

strength (TS), elongation at break (EAB) were evaluated. The TS of gelatin film from shark skin was affected by the protein concentration (1, 2 and 3%) of the film-forming solution (FFS). TS of the film from a 2% protein FFS was the highest. EAB and water vapor permeability (WVP) increased with increasing FFS protein concentration. WVP of shark skin gelatin was evidently low as compared to gelatin films from other fish. An increase in the FFS protein concentration decreased transparency at almost all wavelengths. Furthermore, opacity at 280 nm was characteristically high as compared to films from bony fish skin. The addition of glycerol improved flexibility and enhanced the UV barrier property at 280 nm. However, transparency at the visible range and WVP increased with increasing glycerol content.
From the above, it was suggested that shark skin gelatin film technology can be applied to pharmaceutical products or rich-fat food due to its excellent water and UV barrier properties.
Keywords: Gelatin; Film; Shark skin; Utilization

Evanthia Monogioudi, Nathalie Creusot, Kristiina Kruus, Harry Gruppen, Johanna Buchert, Maija-Liisa Mattinen, Cross-linking of [beta]-casein by Trichoderma reesei tyrosinase and Streptoverticillium mobaraense transglutaminase followed by SEC-MALLS, Food Hydrocolloids, Volume 23, Issue 7, October 2009, Pages 2008-2015, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2009.03.011.
(http://www.sciencedirect.com/science/article/B6VP9-4W04KNN-2/2/7e2a35c952ed0763696c45afe3121036)
Abstract:
Enzymatic modification of proteins, in order to produce functional materials such as hydrogels, adhesives and films via cross-linked networks or scaffolds of proteins, is a constantly evolving technology to create tailored micro- and nanostructured materials for food, cosmetic, and medical applications. For the successful utilization of oxidoreductases or transferases such as tyrosinases and transglutaminases, respectively, it is crucial to understand the action of these enzymes on protein substrates. In this study, cross-linking of the milk protein [beta]-casein by Trichoderma reesei tyrosinase (TrTyr) was studied using size-exclusion chromatography (SEC) equipped with multi-angle light scattering (MALLS) and ultraviolet/visible (UV/Vis) detectors in order to determine the molecular mass (MM), radius of gyration (RG) and degree of polymerization (DP) of the reaction products. Sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) was used to detect early polymerization states. The widely used Streptoverticillium mobaraense transglutaminase (Tgase) was used for comparison to tyrosinase from T. reesei. The results showed that cross-linking of [beta]-casein by these two different types of enzymes resulted in the formation of polymerized reaction products with MM ranging from 500 to 1700 kg mol-1 depending on the enzyme dosage and incubation time. The DP varied from 21 to 71, respectively. In the case of TrTyr the polymerized reaction products were slightly colored, and formation of the covalent cross-linking of [beta]-casein could be monitored by UV/Vis as a function of incubation time.
Keywords: Tyrosinase; Transglutaminase; Cross-linking; [beta]-Casein; Molecular mass; Degree of polymerization; Color formation

Avelina Fernandez, Eva Soriano, Gracia Lopez-Carballo, Pierre Picouet, Elsa Lloret, Rafael Gavara, Pilar Hernandez-Munoz, Preservation of aseptic conditions in absorbent pads by using silver nanotechnology, Food Research International, Volume 42, Issue 8, October 2009, Pages 1105-1112, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.05.009.
(http://www.sciencedirect.com/science/article/B6T6V-4WCSR61-5/2/555bf8a5bfdf9798545da048effbe748)
Abstract:
Silver nanoparticles have been formed in fluff pulp and nanostructured Lyocell fibres by immersion in silver nitrate, and a subsequent transformation of the adsorbed silver ions into elementary silver nanoparticles by physical (thermal/UV) or chemical (sodium borohydride) methods. Microscopy

revealed that nanoparticles generated by physical methods were regular in shape and efficiently dispersed, while the chemical reduction produced highly aggregated nanoparticles. Nanoparticle size has been found relevant to guarantee high antimicrobial activity, being the samples with big aggregated silver nanoparticles almost inefficient. Indeed a satisfactory correlation between silver ion release and the antimicrobial efficiency against Escherichia coli and Staphylococcus aureus could be confirmed, and furthermore, the highest concentrations tested were efficient to reduce the microbial load in poultry exudates. This work demonstrates that especially designed absorbent materials could be optimised to preserve aseptic conditions during manipulation, leading to feasible applications of a silver based nanotechnology in food technology.
Keywords: Antimicrobial activity; Absorbent pads; Cellulose; Food packaging; Silver nanoparticles; Silver reduction

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

Henry Jaeger, Nicolas Meneses, Dietrich Knorr, Impact of PEF treatment inhomogeneity such as electric field distribution, flow characteristics and temperature effects on the inactivation of E. coli and milk alkaline phosphatase, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 470-480, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.03.001.
(http://www.sciencedirect.com/science/article/B6W6D-4VVGKMP-1/2/efc1d657adcf041f55a3ca275efc08d9)
Abstract:
High intensity pulsed electric field (PEF) treatment was investigated focusing on the alteration of electric field distribution, flow characteristics and temperature distribution due to the modification of the treatment chamber. The aim was the improvement of the effectiveness of microbial inactivation of E. coli and to reduce the PEF impact on alkaline phosphatase (ALP) activity in raw milk. Mathematical simulation of the PEF process conditions considering different treatment chamber setups was performed prior to experimental verification. Finally the impact of the treatment chamber modifications on microbial inactivation and enzyme activity was determined experimentally. Using a continuous flow-through PEF system and a co-linear treatment chamber configuration the insertion of stainless steel and polypropylene grids was performed to alter the field strength distribution, increase the turbulence kinetic energy and improve the temperature homogeneity. The Finite Element Method (FEM) analysis showed an improved electric field strength distribution with increased average electric field strength and a reduced standard deviation along the center line of the treatment zone indicating a more homogenous electric field. The velocity profile was improved resulting in an increase of turbulence kinetic energy due to the insertion of the grids. As revealed by mathematical modeling, the temperature of the liquid was decreased, and formation of temperature peaks was avoided. Measured inactivation of heat sensitive alkaline phosphatase (ALP) was reduced from 78% residual activity to 92% after PEF treatment and it could be shown that thermal effects and temperature peaks have been the main reason for enzyme inactivation due to PEF. At the same time, an increase of microbial inactivation of 0.6 log-cycles could be determined experimentally due to the modification of the treatment chamber design.Industrial relevance
The application of pulsed electric field as a non-thermal pasteurization technology requires an accurately defined treatment intensity followed by a predictable microbial inactivation. Unavoidable thermal effects occurring during PEF treatment due to ohmic heating have to be minimized to assure the retention of heat-sensitive nutrients and bioactive compounds. The presented investigations contribute to the fulfilment of these requirements for further successful industrial implementation of the PEF technology such as the selective inactivation or retention of enzyme activity in liquid food systems.
Keywords: Pulsed electric fields; CFD; Treatment chamber design; Milk alkaline phosphatase; E. coli

Sonal Patil, Paula Bourke, Bridget Kelly, Jesus M. Frias, P.J. Cullen, The effects of acid adaptation on Escherichia coli inactivation using power ultrasound, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 486-490, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.06.005.
(http://www.sciencedirect.com/science/article/B6W6D-4WNXV0D-2/2/f6c04367b69ba39624dca70d6258e077)
Abstract:

Inactivation of Escherichia coli in liquids was carried out using power ultrasound. Parameters examined included amplitude levels (0.4 [micro sign]m, 7.5 [micro sign]m, 37.5 [micro sign]m), treatment time, cell condition (non-adapted cells, acid adapted cells), liquid media (TSB, model orange juice and model apple juice) and E. coli strain (ATCC 25922, NCTC 12900). The efficacy of ultrasound treatment was found to be a function of amplitude level, treatment time and media ($p < 0.05$). The kinetics of inactivation followed zero order kinetics ($R > 0.95$), with the highest inactivation achieved using an amplitude of 37.5 [micro sign]m. The D-values of E. coli 25922 at all amplitudes in model orange juice were not significantly different than in TSB media. However, at 0.4 [micro sign]m and 37.5 [micro sign]m amplitude D-values of E. coli 12900 were significantly different in model orange juice compared to TSB media. When efficacy of ultrasound was assessed in model apple juice and phosphate buffered saline treatment times were significantly reduced by comparison with TSB. Inactivation of E. coli was found to be influenced by strain, prior acid adaptation and suspension liquid, but the effect was negated at the higher amplitude levels.Industrial relevance
To facilitate the preservation of unstable nutrients many juice processors have investigated alternatives to thermal pasteurisation, including un-pasteurised short shelf life juices with high retail value. This trend has continued within the European Union. However within the US recent regulations by the FDA have required processors to achieve a 5-log reduction in the numbers of the most resistant pathogens in their finished products. This rule comes after a rise in the number of food borne illness outbreaks and consumer illnesses associated with consumption of untreated juice products. Pathogenic E. coli may survive in acid environments such as fruit juices for long periods. Ultrasound has been identified as one possible non-thermal technology to meet the required microbial log reduction. However it is important to determine if conditions such as acid adaptation and pathogen strain influence ultrasound efficacy, if the technology is to be adopted by industry.
Keywords: Ultrasound; Non-thermal technology; E. coli; Acid adaptation

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

Albert Ibarz, Alfonso Garvin, Salvador Garza, Jordi Pagan, Inactivation of carboxypeptidase A and trypsin by UV-visible light, Innovative Food Science & Emerging Technologies, Volume 10, Issue 4, October 2009, Pages 517-521, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.03.006.
(http://www.sciencedirect.com/science/article/B6W6D-4VYP967-1/2/28f781b64674d2851fe8daef70618f4f)
Abstract:
In the present work, the effect of UV-visible irradiation on the activity of carboxypeptidase A, and trypsin enzymes is shown. The irradiation of the above-mentioned enzymes inhibits their activity, in such a way that sufficiently high irradiation times annul their catalytic action. For carboxypeptidase A a total inactivation after 20 min of irradiation is observed, while trypsin is inactivated completely after 12 min of irradiation. Fitting the data to the Lineweaver-Burk graphs shows that, in the case of CPA enzyme, the inhibition caused by irradiation is similar to that of uncompetitive type. For trypsin, the irradiation acts similarly to a mixed inhibition-type.Industrial relevance
UV irradiation is a technology used in food treatment, since it has been shown to be effective in the destruction of microorganisms. It can also be applied in the sterilization of enzymatic preparations used in the food industry, but it can have harmful effects, since it can go so far as to inactivate some of the enzymes. In some cases it interests to inactivate enzymes, and it is for it that this treatment type can be effective. In other cases it interests that the enzymes remain active. This way, it will be necessary to avoid that they are exposed to the light.
Keywords: UV light; Trypsin; Carboxypeptidase A; Enzyme inhibition

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

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

Matthew L. Wittenrich, Nicole R. Rhody, Ralph G. Turingan, Kevan L. Main, Coupling osteological development of the feeding apparatus with feeding performance in common snook, Centropomus undecimalis, larvae: Identifying morphological constraints to feeding, Aquaculture, Volume 294, Issues 3-4, 16 September 2009, Pages 221-227, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2009.06.006.
(http://www.sciencedirect.com/science/article/B6T4D-4WGVPP5-5/2/2d14e2efb00552bb957536a01c406693)
Abstract:
Identifying bottlenecks to feeding in marine finfish larvae is becoming a dominant theme as commercially important fish stocks collapse worldwide. The transition from endogenous yolk reserves to feeding exogenously is perhaps the largest constraint to developing aquaculture technologies in closed systems. Mass mortality during early larval development is generally attributed to a lack of suitable prey during the first feeding stage, however, empirical evidence identifying a causal link between morphology and performance remains scarce. In this study, we examined the link between osteological development of the feeding apparatus and feeding

performance, expressed as (1) the median number of prey consumed by larvae and (2) the median size of prey consumed by larvae, during larval development of the common snook, Centropomus undecimalis. Cluster analysis, nMDS, and SIMPER analysis allowed us to identify functional intervals of the feeding apparatus through larval development. Results revealed that first feeding larvae exhibited rudimentary skeletal elements and selected only one or two of the prey types available relative to older larvae, which included more and larger prey types in their diet. Upon complete formation of the hyoid apparatus, around 8 dph, a dietary shift to rotifers was observed suggesting that high rates of mortality observed in closed culture systems may be attributed to the absence of a suitable small, non-elusive food organism during the first feeding stage. First feeding larvae exhibit a poorly developed feeding apparatus that may constrain their ability to consume elusive prey as an initial diet. Based on the association between stage-specific characteristics of the feeding apparatus and corresponding stage-specific metrics of feeding performance established in this study, we propose a stage-specific feeding-management scheme for snook hatchery aquaculture.
Keywords: Snook; Larval fish; Feeding ecology; Prey selectivity

Vera Brencic, Denise Young, Time-saving innovations, time allocation, and energy use: Evidence from Canadian households, Ecological Economics, Volume 68, Issue 11, 15 September 2009, Pages 2859-2867, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2009.06.005.
(http://www.sciencedirect.com/science/article/B6VDY-4WM51WH-2/2/bd9af117f1b4edde72eb1b3875a5cb28)
Abstract:
Time and energy are major inputs into the production of household goods and services. As a result, the market penetration of time-saving technologies for general household use is expected to affect both a household's (i) allocation of time across home production and leisure activities; and (ii) energy use. For example, with a household's adoption of a microwave or a dishwasher, cooking food and washing dishes will require less time, and therefore in-home meal preparation may increase. Households with microwaves or dishwashers may also opt to spend more time undertaking other production activities, inside or outside the home, or engage in more leisure (watching TV, reading, exercising). To the extent that time is reallocated from less to more energy-intensive activities in the home, residential energy use will increase as households adopt appliances that embody time-saving technology. Furthermore, an adoption of time-saving technologies for basic household chores, such as meal preparation and laundry, can impact energy use due to the fact that many time-saving technologies are more energy intensive than alternative technologies that require larger time commitments. In this paper, we use the Canadian Survey of Household Energy Use data from 2003 to examine the extent to which ownership of products that embody time-saving innovations affects time allocation and energy use at the household level.
Keywords: Time rebound effects; Residential energy use; Household production

Federica Maltese, Cornelis Erkelens, Frank van der Kooy, Young Hae Choi, Robert Verpoorte, Identification of natural epimeric flavanone glycosides by NMR spectroscopy, Food Chemistry, Volume 116, Issue 2, 15 September 2009, Pages 575-579, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.03.023.
(http://www.sciencedirect.com/science/article/B6T6R-4VTCMCP-1/2/a716720e6a16fb078c9cf5d0b0f2b15f)
Abstract:
Recently advanced analytical technology has provided evidence of the existence of stereoisomers of many natural products. Particularly, flavanones which might have two different configurations at C-2 exist in many food additives, e.g., citrus fruits. In this study, the possible stereoisomers of flavanone glycosides were identified by NMR spectroscopy. Based on NMR spectra of common

flavanone glycosides such as naringin, hesperidin, and neohesperidin, the two existing diastereomeric forms of the molecules could clearly be distinguished. The 1H NMR resonances of two diastereomers of each flavanone glycosides investigated in this study were fully assigned with the assistance of diverse 2D NMR spectroscopy methods.
Keywords: Flavanone; Citrus fruits; Stereoisomers; NMR

David Parsons, Luis Ramirez-Aviles, Jerome H. Cherney, Quirine M. Ketterings, Robert W. Blake, Charles F. Nicholson, Managing maize production in shifting cultivation milpa systems in Yucatan, through weed control and manure application, Agriculture, Ecosystems & Environment, Volume 133, Issues 1-2, September 2009, Pages 123-134, ISSN 0167-8809, DOI: 10.1016/j.agee.2009.05.011.
(http://www.sciencedirect.com/science/article/B6T3Y-4WH0JKW-3/2/a8d554fb8e9a53b1cce8f0afbbcbec2a)
Abstract:
Milpa cultivation involving cutting an area of forest, burning, and planting crops has existed in the Yucatan Peninsula for more than three millennia. Fallow periods are short and decreasing, leading to a productivity collapse of the system. Technologies that increase yield and maintain plots under cultivation have the potential to decrease the land area needed for family food production, resulting in more mature forests. This study was undertaken to examine the relative importance and potential interactions of declining fertility and increasing weed pressure in reducing maize (Zea mays L.) yields, and to examine the effectiveness of combinations of weed control and sheep manure fertilization rates in sustaining productivity. The study sites were located near Merida, Yucatan, Mexico. The experimental design with three replicates consisted of two sites, 2 cultivation years (1 or more than 1 year of cultivation), three sheep manure application rates (none, 4 Mg DM ha-1, and 8 Mg DM ha-1), and three weed control treatments (none, traditional hand weeding, and herbicide). Measurements included labor required for weed control, weed cover, and maize leaf, stem, and grain harvest and quality. Considerably more labor was needed for hand weeding than for chemical control. At harvest, grass and woody weed cover was greatest for plots with hand or no weed control. Herbicide and, to a lesser extent, hand weeding were effective in controlling herbaceous weeds after the first year of cultivation. Manure applications of 4 Mg DM ha-1 and 8 Mg DM ha-1 increased grain yields by one half (415 kg DM ha-1 and 425 kg DM ha-1), stem yields by 36% (549 kg DM ha-1) and 50% (758 kg DM ha-1), and leaf yields by 40% (386 kg DM ha-1) and 45% (431 kg DM ha-1). With increasing cultivation year, chemical weed control was more effective than hand weed control in maintaining yields. Treatments had minor effects on protein and fiber concentrations of leaf, stem, and grain. Modest manure fertilization combined with chemical weed control has the potential to maintain or increase yields in repeatedly cultivated plots. Manure application could be implemented and maintained on smallholder farms with sheep.
Keywords: Manure; Milpa; Shifting cultivation; Weed control

Nada Smigic, Andreja Rajkovic, Eszter Antal, Helga Medic, Barbara Lipnicka, Mieke Uyttendaele, Frank Devlieghere, Treatment of Escherichia coli O157:H7 with lactic acid, neutralized electrolyzed oxidizing water and chlorine dioxide followed by growth under sub-optimal conditions of temperature, pH and modified atmosphere, Food Microbiology, Volume 26, Issue 6, September 2009, Pages 629-637, ISSN 0740-0020, DOI: 10.1016/j.fm.2009.04.010.
(http://www.sciencedirect.com/science/article/B6WFP-4W7J0YR-1/2/c1277181551789d8aaccf014c0dc0b55)
Abstract:
The utilization of sub-lethal decontamination treatments gains more and more interest due to the increased consumers' demand for fresh, minimally processed and convenient food products. These products rely on cold chain and hurdle (combination) technology to provide microbiological

safety and quality during their shelf life. To investigate the ability of surviving cells to resuscitate and grow in a food simulating environment, sub-lethal decontamination treatments were coupled with subsequent storage under sub-optimal growth conditions. For this purpose chlorine dioxide (ClO2) and neutralized electrolyzed oxidizing water (NEW)-treated cultures of Escherichia coli O157:H7 were inoculated in TSB-YE of pH 5.8 and aw 0.99, and stored at 10 [degree sign]C, 12.5 [degree sign]C and 15 [degree sign]C, under four different atmospheres (0%, 30% and 60% CO2 balanced with N2, and air). Due to the severity of injury, lactic acid-treated cells were inoculated in TSB-YE pH 7.0. Data obtained reveal that the fraction of sub-lethally injured E. coli O157:H7 undergoes an additional inhibitory effect during the storage period under of sub-optimal conditions. Observed extension in the lag growth phase was a direct consequence prior sub-lethal injury. The effects of liquid ClO2 and NEW were less pronounced in comparison to lactic acid. The current study signifies the potential utilization of appropriate combination of different extrinsic and intrinsic factors in the elimination or growth inhibition of food-borne pathogens.
Keywords: Escherichia coli O157:H7; Lactic acid; Chlorine dioxide; Neutral electrolyzed oxidizing water; Modified atmosphere packaging; Sub-lethal injury

Xiao Dong Chen, Dong Li, Food powder technology, Journal of Food Engineering, Volume 94, Issue 2, Food Powder Technology, September 2009, Page 129, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.02.027.
(http://www.sciencedirect.com/science/article/B6T8J-4VT5TFJ-2/2/93cccde72fcf90a9ac98d924b0f8b10c)

C. Byrd-Bredbenner, S. Schefske, C. Cuite, W. Hallman, Characterizing the Nutrient and Calorie Content of Home Food Supplies Using Mobile Universal Product Code (UPC) Scanning Technology, Journal of the American Dietetic Association, Volume 109, Issue 9, Supplement 1, ADA Food & Nutrition Conference & Expo, September 2009, Page A50, ISSN 0002-8223, DOI: 10.1016/j.jada.2009.06.148.
(http://www.sciencedirect.com/science/article/B758G-4X25VK2-57/2/1ed74fd982862bf7cc197d638dd0ce40)

K.R. Roberts, V.M. Remig, T.J. Bryant, G. Snyder, Older Adults' Technology Preferences Related to Food Safety Education, Journal of the American Dietetic Association, Volume 109, Issue 9, Supplement 1, ADA Food & Nutrition Conference & Expo, September 2009, Page A64, ISSN 0002-8223, DOI: 10.1016/j.jada.2009.06.204.
(http://www.sciencedirect.com/science/article/B758G-4X25VK2-77/2/b67dbd422fbd85e5f2901af86dd6285f)

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

Jane Learmount, Chris Conyers, Colin Morgan, Barbara H Craig, Georg von Samson-Himmelstjerna, Mike Taylor, Development and validation of real time PCR methods for diagnosis of Teladorsagia circumcincta and Haemonchus contortus in sheep, Veterinary Parasitology, In

Press, Accepted Manuscript, Available online 26 August 2009, ISSN 0304-4017, DOI: 10.1016/j.vetpar.2009.08.017.
(http://www.sciencedirect.com/science/article/B6TD7-4X378HT-3/2/98a96b5367fcc1e87fc1f5a74e4e28a8)
Abstract:
Parasitic gastroenteritis, a disease caused by parasitic nematodes, is of major concern to the sheep industry and threatens sustainability. Traditional methods for diagnosis of the type and level of infection in a sheep flock require laborious laboratory extraction, culture and microscopic examination of eggs or larvae from faecal samples. Advances in molecular technology offer the potential for more efficient and reliable methods. This study aimed to develop and test a real time PCR method for routine diagnosis of infection by Teladorsagia circumcincta and Haemonchus contortus in sheep.
Primer/probe sets were designed around the ribosomal internal transcribed spacer 2 (ITS2) region as sequence data was available from other studies and so tests used published primer/probe sets, as well as those designed at the Food and Environment Research Agency (Fera). Different primer/probe combinations were tested for specificity against DNA extracted from T. circumcincta larvae or H. contortus DNA. All sets were tested for cross reactivity against 4 other closely related species, using real-time PCR technology. Reactions were optimised with the best primer/probe combination for each species and then tested for sensitivity against samples containing different T. circumcincta or H. contortus DNA concentrations.
Faecal samples were collected from sheep infected with T. circumcincta or H. contortus alone and the eggs harvested, counted and DNA extracted. Serial dilutions were prepared to give a range of concentrations between approximately 3000 and 50 eggs per sample and real time PCR reactions were carried out for each and mean cycle time (Ct) values were calculated. These Ct values were plotted against the sample egg concentration to produce a standard curve. Regression analysis was carried out using the generated data. Eggs were then harvested from faecal samples collected in the field from sheep carrying natural mixed infections, DNA extracted and Ct values recorded as before. Results were compared to the standard curve data in order to calculate the approximate number of T. circumcincta and H. contortus eggs in each field sample. These values were compared to the number of eggs determined using the traditional laboratory methods and Pearson product-moment correlation coefficients calculated. Results showed a strong correlation between numbers of eggs determined using the traditional and novel molecular methods suggesting that the developed molecular tools adequately predict egg numbers in this range. Further development and validation work should allow practical use of the method. This assay has significant advantages over the traditional methods currently used routinely at Fera and other parasitology laboratories and these are discussed.
Keywords: Parasitic gastroenteritis; Sheep; Real time PCR; Molecular diagnostics

Hugh Turral, Mark Svendsen, Jean Marc Faures, Investing in irrigation: Reviewing the past and looking to the future, Agricultural Water Management, In Press, Corrected Proof, Available online 22 August 2009, ISSN 0378-3774, DOI: 10.1016/j.agwat.2009.07.012.
(http://www.sciencedirect.com/science/article/B6T3X-4X2BV4D-1/2/89c97c45dd320e9f7a4a431d9f69bbac)
Abstract:
This article gives a brief review of the development and current situation in global irrigation, and looks at the drivers affecting irrigation performance, development and modernization. The article concludes that the options for new developments are limited, and that future investment will need to be more precisely targeted to specific niches in different agroecological and economic contexts. The paper notes the powerful implications of global climatic change on irrigation through changes in hydrology and water supply that, in conjunction with (1) continued demand for cheap food to satisfy continuously growing populations and changing dietary preferences (projected to 2050) and

(2) increasing competition for high reliability water from higher value economic sectors, indicate irrigation performance and the productivity of agricultural water use must further improve, and are also likely to become more targeted at higher value enterprises. Improving management, through better institutions and better technology will require constant adaptation and finessing, with no silver bullets currently on the horizon.
Keywords: Irrigation; Investment; Climatic change; Performance; Institutions; Groundwater; Storage; Poverty; Food security

Valborg Kvakkestad, Institutions and the R&D of GM-crops, Ecological Economics, Volume 68, Issue 10, 15 August 2009, Pages 2688-2695, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2009.05.004.
(http://www.sciencedirect.com/science/article/B6VDY-4WGSM4P-1/2/dfb5e202605f203b9e952d2a59a54f51)
Abstract:
This paper analyzes how different institutional structures shape the research and development (R&D) of genetically modified crops (GM-crops). Whether this R&D is conducted within companies, cooperatives or public research organizations (both publicly and privately funded R&D) is expected to influence the type of crops and traits that are developed and therefore the effects on society and ecosystems that potentially could follow from the use of GM-crops. This issue is analyzed empirically by statistical analysis of 1323 notifications for field trials with GM-crops that have been submitted under two EU Directives in seven European countries. The results show that the type of R&D organization influences the traits and crops that are developed. Companies are more likely to submit notifications that concern GM-crops that secure the potential for profit than are other types of R&D organizations, while R&D organizations that are purely publicly funded are more likely to submit notifications that only concern biosafety research than are cooperatives and companies. Consideration of the environment, food safety and food security might justify institutional reforms of R&D of GM-crops. This might include increased public funding combined with changes in intellectual property rights.
Keywords: GM-crops; Technology; Institutional shaping

Costas M. Pontikakos, Theodore A. Tsiligiridis, Maria E. Drougka, Location-aware system for olive fruit fly spray control, Computers and Electronics in Agriculture, In Press, Corrected Proof, Available online 7 August 2009, ISSN 0168-1699, DOI: 10.1016/j.compag.2009.07.013.
(http://www.sciencedirect.com/science/article/B6T5M-4WY5BC1-3/2/a48de5883ba8fde49ecbec43bf27fbaf)
Abstract:
Location awareness is essential for many Precision Farming (PF) tasks with strong spatiotemporal, environmental, public health and food safety characteristics. Nevertheless, its role is much more crucial in PF tasks with efficacy depending mainly on local climate conditions and the collaboration of users. A PF task with the aforementioned characteristics is the insecticide-bait ground spraying against olive fruit fly, the most serious pest on olive cultivations. It requires location awareness, so as to be more efficient, friendly for the environment and the domestic areas, and ensure olive products with low insecticide residues. This research proposes an innovative, integrated, Location-Aware System (LAS) suitable for the ground control of the olive fruit fly. The developed system enables rapid prototyping of Location-Aware (LA) services in an intelligent PF environment combining location sensing technologies with wireless Internet, Geographical Information Systems (GIS), and Expert Systems (ES). We focus on the functional and operational capabilities of the middleware architecture, on the design issues of the developed GIS, ES, and LA modules, as well as, on the factors and infrastructure that must be considered during the spraying process. Based on this framework we developed specific LA services, such as finding the area to be sprayed, estimating the amount of the spraying solution required, canceling

the spraying process, etc. These services aim in a more efficient and environmental friendly treatment. To validate the LAS a moderate-scale experiment is performed showing that the proposed system is functional and operational. LAS consult effectively the tractor attendants on how to spray, by means of reducing spraying failures and minimizing the decisions that must be taken during spraying process. Preliminary results report that with LAS no over sprayings occur, sprayings are based on infestation risk, cultivation characteristics, and meteorological conditions. Finally, a safe distance from biological cultivations, environmental protected and domestic areas is kept, avoiding pollution of these areas with insecticide residues.
Keywords: Location-aware system; Expert system; Geographical Information System; Precision Farming; Olive fruit fly

P. Dorny, N. Praet, N. Deckers, S. Gabriel, Emerging food-borne parasites, Veterinary Parasitology, Volume 163, Issue 3, One World, One Health: Parasites in a changing landscape - Plenary Lectures presented at the 22nd International Conference of the World Association for the Advancement of Veterinary Parasitology, 7 August 2009, Pages 196-206, ISSN 0304-4017, DOI: 10.1016/j.vetpar.2009.05.026.
(http://www.sciencedirect.com/science/article/B6TD7-4WGK4N8-6/2/46a7858bde21ad9a336bfee03917ff46)
Abstract:
Parasitic food-borne diseases are generally underrecognised, however they are becoming more common. Globalization of the food supply, increased international travel, increase of the population of highly susceptible persons, change in culinary habits, but also improved diagnostic tools and communication are some factors associated with the increased diagnosis of food-borne parasitic diseases worldwide. This paper reviews the most important emerging food-borne parasites, with emphasis on transmission routes. In a first part, waterborne parasites transmitted by contaminated food such as Cyclospora cayetanensis, Cryptosporidium and Giardia are discussed. Also human fasciolosis, of which the importance has only been recognised in the last decades, with total numbers of reported cases increasing from less than 3000 to 17 million, is looked at. Furthermore, fasciolopsiosis, an intestinal trematode of humans and pigs belongs to the waterborne parasites as well. A few parasites that may be transmitted through faecal contamination of foods and that have received renewed attention, such as Toxoplasma gondii, or that are (re-)emerging, such as Trypanosoma cruzi and Echinococcus spp., are briefly reviewed. In a second part, meat-borne parasite infections are reviewed. Humans get infected by eating raw or undercooked meat infected with cyst stages of these parasites. Meat inspection is the principal method applied in the control of Taenia spp. and Trichinella spp. However, it is often not very sensitive, frequently not practised, and not done for T. gondii and Sarcocystis spp. Meat of reptiles, amphibians and fish can be infected with a variety of parasites, including trematodes (Opisthorchis spp., Clonorchis sinensis, minute intestinal flukes), cestodes (Diphyllobothrium spp., Spirometra), nematodes (Gnathostoma, spp., anisakine parasites), and pentastomids that can cause zoonotic infections in humans when consumed raw or not properly cooked. Another important zoonotic food-borne trematode is the lungfluke (Paragonimus spp.). Traditionally, these parasitic zoonoses are most common in Asia because of the particular food practices and the importance of aquaculture. However, some of these parasites may emerge in other continents through aquaculture and improved transportation and distribution systems. Because of inadequate systems for routine diagnosis and monitoring or reporting for many of the zoonotic parasites, the incidence of human disease and parasite occurrence in food is underestimated. Of particular concern in industrialised countries are the highly resistant waterborne protozoal infections as well as the increased travel and immigration, which increase the exposure to exotic diseases. The increased demand for animal proteins in developing countries will lead to an intensification of the production systems in which the risk of zoonotic infections needs to be assessed. Overall, there is an urgent need for better monitoring and control of food-borne parasites using new technologies.

Keywords: Parasites; Food; Zoonoses

Amparo Lopez-Rubio, Elliot Paul Gilbert, Neutron scattering: A natural tool for food science and technology research, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 5 August 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.07.008.
(http://www.sciencedirect.com/science/article/B6VHY-4WXSJYP-1/2/9af2066eb54709b48520ee3dd49177ae)
Abstract:
Neutron scattering is a powerful tool for the study of soft condensed matter. The use of neutron techniques in combination with traditional characterisation techniques used in food science can provide a unique insight into novel food materials, providing the knowledge to develop new formulations. As these methods have traditionally been poorly utilised in food science research, this paper highlights the potential of neutron scattering techniques in this arena and provides some recent examples in its application across food components with an outlook of some potentially interesting applications.

F.M.N.A. Aida, M. Shuhaimi, M. Yazid, A.G. Maaruf, Mushroom as a potential source of prebiotics: A review, Trends in Food Science & Technology, In Press, Corrected Proof, Available online 3 August 2009, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.07.007.
(http://www.sciencedirect.com/science/article/B6VHY-4WXBM6T-1/2/ef27a68d0b72ed9c4e63a867af79906c)
Abstract:
The demand from health conscious consumers has lead to emergence of various functional foods. Trend in food science and technology has shown development of prebiotic, which is able to modulate the human gut microbiota and improve the host health in return. The concept has been introduced for more than a decade with inulin and oligosaccharides being the most established and studied prebiotics. Better understanding on the benefits of prebiotics has urged a need for invention of new sources of prebiotics. This paper reviewed the potential of mushrooms as a source of prebiotic with thorough explanation on its concept and application.

Athanasios A. Koutinas, Harris Papapostolou, Dimitra Dimitrellou, Nikolaos Kopsahelis, Eleftheria Katechaki, Argyro Bekatorou, Loulouda A. Bosnea, Whey valorisation: A complete and novel technology development for dairy industry starter culture production, Bioresource Technology, Volume 100, Issue 15, Second International Conference on Engineering for Waste Valorisation (WasteEng2008, August 2009, Pages 3734-3739, ISSN 0960-8524, DOI: 10.1016/j.biortech.2009.01.058.
(http://www.sciencedirect.com/science/article/B6V24-4VR6K7H-7/2/5992523f14700ba67d285c7ff9b882ce)
Abstract:
Whey is the major by-product of the dairy industry, produced in large quantities and usually disposed off causing major environmental pollution, due to its high organic load that makes treatment cost prohibitive. This paper comprises a contribution on the valorisation of this high polluting liquid waste of the dairy industry, based on research for the production of novel dairy starter cultures using whey as raw material. Starter cultures are used for cheese ripening in order to: (i) accelerate ripening, (ii) improve quality and (iii) increase shelf-life. The developed technology involves biomass production from whey followed by thermal drying of cultures. Specifically, Kluyveromyces marxianus, Lactobacillus bulgaricus and kefir yeasts were thermally dried, and their efficiency in lactose and milk whey fermentations was studied. The most suitable culture regarding its technological properties was kefir, which was used for cheese ripening in freeze-dried and thermally dried form. Besides the reduction of production cost, which is an essential requirement for the food industry, the use of thermally dried kefir displayed several other

advantages such as acceleration of ripening, increase of shelf-life, and improvement of hard-type cheese quality.
Keywords: Whey; Starter cultures; Dairy; Drying

Mark W. Davey, Inge Van den Bergh, Richard Markham, Rony Swennen, Johan Keulemans, Genetic variability in Musa fruit provitamin A carotenoids, lutein and mineral micronutrient contents, Food Chemistry, Volume 115, Issue 3, 1 August 2009, Pages 806-813, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.12.088.
(http://www.sciencedirect.com/science/article/B6T6R-4VBT27F-2/2/4889b5c7b6c4e5c4fc098abd0cb5e9e3)
Abstract:
Bananas and plantains (Musa spp.) are a staple food for millions of impoverished people and as such are an important source of vitamins and micronutrients. To evaluate the potential of Musa spp. to meet dietary micronutrients requirements, we have screened 171 different genotypes for fruit provitamin A carotenoids (pVACs) contents, and a subset of 47 genotypes for macro- and micro-mineral (iron and zinc) contents using standardised sampling and analytical protocols. The results indicate that there is substantial variability in mean fruit pulp pVACs contents between cultivars, and that cultivars with a high fruit pVACs content are widely distributed across the different genome groups but only at a low frequency. The introduction of such high pVACs cultivars has much potential for improving the vitamin A nutritional status of Musa-dependent populations at modest and realistic fruit-consumption levels. In contrast, fruit pulp mineral micronutrient contents (iron and zinc), were low and showed limited inter-cultivar variability, even for genotypes grown under widely-differing environments and soil types. Results are discussed within the framework of the development of strategies to improve the nutritional health and alleviation of micronutrient deficiencies within Musa-consuming population groups.
Keywords: Banana; Biofortification; Fe; HarvestPlus; Micronutrients; Musa; Nutrition; Plantain; Provitamin A carotenoids; Vitamin A; Zn

Michael A. Rogers, Novel structuring strategies for unsaturated fats - Meeting the zero-trans, zero-saturated fat challenge: A review, Food Research International, Volume 42, Issue 7, August 2009, Pages 747-753, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.02.024.
(http://www.sciencedirect.com/science/article/B6T6V-4VR9FFN-3/2/042f510cb26935888c1a70cbf05a1e5e)
Abstract:
Numerous foods acquire their elastic properties (i.e., snap, mouth-feel, and hardness) from the colloidal fat crystal network comprised primarily of trans- and saturated fats. These hardstock fats contribute, along with numerous other factors, to the global epidemics related to metabolic syndrome and cardiovascular disease. A dire need for new technologies capable of structuring unsaturated edible oils, reducing the necessity for trans- and saturated fats, are required. At present, organogels are under-utilized in the food industry but numerous potential organogelators exist including: phytosterols and oryzanols, ceramides, monoglycerides and waxes. When examining these compounds as suitable ingredients for the food industry, they should be food grade, cost effective, have no negative health implications and one should be able to modify their physical properties. This review considers alternatives to colloidal fat crystal networks when structuring unsaturated oils as well as methods to modify their physical properties.
Keywords: Organogel; Unsaturated oil; Structure; SAFiN; Trans fats; Saturated fats

S.M. Ghoreishi, R. Gholami Shahrestani, Subcritical water extraction of mannitol from olive leaves, Journal of Food Engineering, Volume 93, Issue 4, August 2009, Pages 474-481, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.02.015.

(http://www.sciencedirect.com/science/article/B6T8J-4VNH3K3-9/2/a1edb518402c30d42ba73601170f9fea)
Abstract:
Subcritical water extraction was investigated as a novel and alternative technology in the food and pharmaceutical industry for the separation of mannitol from olive leaves and its results were compared with those of Soxhlet extraction. The effects of temperature, pressure, and flow rate of water and also momentum and mass transfer dimensionless variables such as Reynolds and Peclet Numbers on extraction yield and equilibrium partition coefficient were investigated. The operating conditions were: 3-11 MPa, 333-423 K, and water flow rates of 3.3E-9-3.3E-8 m3/s. The results revealed that the highest mannitol yield was obtained at 373 K and 5 MPa. However, the extraction of mannitol was not influenced by the variation of flow rate. A mathematical model for mannitol extraction was also developed which predicted the experimental measurements very well. In addition, the results indicated higher extraction yield and lower partition coefficient for the subcritical water extraction in contrast to Soxhlet method.
Keywords: Extraction; Subcritical water; Mannitol; Olive leaves; Modeling; Soxhlet

Sarita Raengpradub, Microbial Identification: Tracking the Great Unknown with Innovative and Advanced Technologies, Journal of the Association for Laboratory Automation, Volume 14, Issue 4, Automation in Food and Agricultural Laboratories, August 2009, Pages 232-234, ISSN 1535-5535, DOI: 10.1016/j.jala.2008.12.011.
(http://www.sciencedirect.com/science/article/B75DF-4WNXF44-F/2/767534a029fba17a1f28d0a3cd510889)
Abstract:
Major changes in production and distribution practices in the global food industry are prompting increased scientific efforts to identify, understand, and control the transmission of microbial contaminants. Through the development of advanced diagnostic tools, significant inroads in microbial source tracking are making important contributions to the safety of the food supply.
Keywords: molecular biology; PCR; molecular subtyping

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

Zenobia C.Y. Chan, Wing-Fu Lai, Revisiting the melamine contamination event in China: implications for ethics in food technology, Trends in Food Science & Technology, Volume 20, Issue 8, August 2009, Pages 366-373, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.04.005.
(http://www.sciencedirect.com/science/article/B6VHY-4W741XS-1/2/d773585423d697d619ef5281d318882c)

Abstract:
Food technology is a burgeoning field of applied science, invading many areas of the food industry and making contributions to economic advancement; however, little research has focused on ethical aspects in this field. This article attempts to fill this knowledge gap by revisiting the tainted milk event in China in 2008, followed by a detailed discussion of the application of food technology ethics in industrial contexts. Through the lesson learnt in the Chinese food industry, it is hoped that more global concerns on ethical issues in food technology will be raised, thereby creating a more humane food production industry.

M. Uyttendaele, P. Busschaert, A. Valero, A.H. Geeraerd, A. Vermeulen, L. Jacxsens, K.K. Goh, A. De Loy, J.F. Van Impe, F. Devlieghere, Prevalence and challenge tests of Listeria monocytogenes in Belgian produced and retailed mayonnaise-based deli-salads, cooked meat products and smoked fish between 2005 and 2007, International Journal of Food Microbiology, Volume 133, Issues 1-2, 31 July 2009, Pages 94-104, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.05.002.
(http://www.sciencedirect.com/science/article/B6T7K-4W7YXN1-3/2/7a71e9ac26dd4bf31dfdff3735aebdde)
Abstract:
Processed ready-to-eat (RTE) foods with a prolonged shelf-life under refrigeration are at risk products for listeriosis. This manuscript provides an overview of prevalence data (n = 1974) and challenge tests (n = 299) related to Listeria monocytogenes for three categories of RTE food i) mayonnaise-based deli-salads (1187 presence/absence tests and 182 challenge tests), ii) cooked meat products (639 presence/absence tests and 92 challenge tests), and iii) smoked fish (90 presence/absence tests and 25 challenge tests), based on data records obtained from various food business operators in Belgium in the frame of the validation and verification of their HACCP plans over the period 2005-2007. Overall, the prevalence of L. monocytogenes in these RTE foods in the present study was lower compared to former studies in Belgium. For mayonnaise-based deli-salads, in 80 out of 1187 samples (6.7%) the pathogen was detected in 25 g. L. monocytogenes positive samples were often associated with smoked fish deli-salads. Cooked meat products showed a 1.1% (n = 639) prevalence of the pathogen. For both food categories, numbers per gram never exceeded 100 CFU. L. monocytogenes was detected in 27.8% (25/90) smoked fish samples, while 4/25 positive samples failed to comply to the 100 CFU/g limit set out in EU Regulation 2073/2005. Challenge testing showed growth potential in 18/182 (9.9%) deli-salads and 61/92 (66%) cooked meat products. Nevertheless, both for deli-salads and cooked meat products, appropriate product formulation and storage conditions based upon hurdle technology could guarantee no growth of L. monocytogenes throughout the shelf-life as specified by the food business operator. Challenge testing of smoked fish showed growth of L. monocytogenes in 12/25 samples stored for 3-4 weeks at 4 [degree sign]C. Of 45 (non-inoculated) smoked fish samples (13 of which were initially positive in 25 g) which were subjected to shelf-life testing, numbers exceeded 100 CFU/g in only one sample after storage until the end of shelf-life. Predictive models, dedicated to and validated for a particular food category, taking into account the inhibitory effect of various factors in hurdle technology, provided predictions of growth potential of L. monocytogenes corresponding to observed growth in challenge testing. Based on the combined prevalence data and growth potential, mayonnaise-based deli-salads and cooked meat products can be classified as intermediate risk foods, smoked fish as a high risk food.
Keywords: Listeria monocytogenes; Prevalence; Challenge testing; Cooked meat; Deli-salads; Smoked fish

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

L. Jacxsens, P.A. Luning, J.G.A.J. van der Vorst, F. Devlieghere, R. Leemans, M. Uyttendaele, Simulation modelling and risk assessment as tools to identify the impact of climate change on microbiological food safety - the case study of fresh produce supply chain, Food Research International, In Press, Accepted Manuscript, Available online 25 July 2009, ISSN 0963-9969, DOI: 10.1016/j.foodres.2009.07.009.
(http://www.sciencedirect.com/science/article/B6T6V-4WVF6MH-2/2/52b9217cb34d742bb1871232633b6a32)
Abstract:
The current quality assurance and control tools and methods to prevent and/or to control microbiological risks associated with fresh produce are challenged due to the following pressures upon the food supply chain, i.e. changing consumption patterns, globalization and climate change. It demonstrates the need for scientific research and development of new and/or improved tools, techniques and practices to adapt the current risk management systems. In this paper, a conceptual research approach is presented to analyse the complexity of the climate change and globalization challenge on the fresh produce supply chain taken as a case study. The factors which affect the vulnerability of the fresh produce chain demand a multidisciplinary research approach. The proposed knowledge-based modelling system is believed to be a most appropriate way to identify problems and to offer solutions to monitor and prevent microbiological food safety risks during all phases of food production and supply. To explore the potential impact of climate change and globalization, baseline information can be obtained by surveillance and performance measurement of implemented food safety management systems. Simulation of climate change scenarios and the logistic chain of fresh produce, along with mathematical models to optimize packaging technology to maintain quality and safety of fresh produce are tools to provide insights in the complex dynamic ecosystem. They are the basis for elaboration of risk assessment studies to scientifically support management options and decisions to new microbiological threats related to globalization and climate change in the fresh produce supply chain. This research concept as such will contribute to develop strategies in order to guarantee the (microbiological) food safety of fresh produce on the long term.
Keywords: climate change; Microbiological food safety; Fresh produce; Food safety management system

Polymeros Chrysochou, George Chryssochoidis, Olga Kehagia, Traceability information carriers. The technology backgrounds and consumers' perceptions of the technological solutions, Appetite,

In Press, Corrected Proof, Available online 23 July 2009, ISSN 0195-6663, DOI: 10.1016/j.appet.2009.07.011.
(http://www.sciencedirect.com/science/article/B6WB2-4WV15H3-2/2/d2ae0a208e2c2bb734142e03edb77ef5)
Abstract:
The implementation of traceability in the food supply chain has reinforced adoption of technologies with the ability to track forward and trace back product-related information. Based on the premise that these technologies can be used as a means to provide product-related information to consumers, this paper explores the perceived benefits and drawbacks of such technologies. The aim is to identify factors that influence consumers' perceptions of such technologies, and furthermore to advise the agri-food business on issues that they should consider prior to the implementation of such technologies in their production lines. For the purposes of the study, a focus group study was conducted across 12 European countries, while a set of four different technologies used as a means to provide traceability information to consumers was the focal point of the discussions in each focus group. Results show that the amount of and confidence in the information provided, perceived levels of convenience, impact on product quality and safety, impact on consumers' health and the environment, and potential consequences on ethical and privacy liberties constitute important factors influencing consumers' perceptions of technologies that provide traceability.
Keywords: Traceability; Consumer; Focus groups; RFID; Barcode

Abel Ortiz, Gemma Echeverria, Jordi Graell, Isabel Lara, Corrigendum to: 'Overall quality of `Rich Lady' peach fruit after air- or CA storage. The importance of volatile emission' [LWT - Food Science and Technology 42 (2009) 1520-1529], LWT - Food Science and Technology, In Press, Corrected Proof, Available online 16 July 2009, ISSN 0023-6438, DOI: 10.1016/j.lwt.2009.06.021.
(http://www.sciencedirect.com/science/article/B6WMV-4WSG308-1/2/6a8c1118ed92ccf1c85b05b0baaa2b06)

Seddik Khalloufi, Cristhian Almeida-Rivera, Peter Bongers, Supercritical-CO2 drying of foodstuffs in packed beds: Experimental validation of a mathematical model and sensitive analysis, Journal of Food Engineering, In Press, Corrected Proof, Available online 12 July 2009, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2009.07.005.
(http://www.sciencedirect.com/science/article/B6T8J-4WRM6GY-1/2/7dfeec14b65825123aec3a7d30457368)
Abstract:
In this contribution, a mathematical model is built to predict the changes in water concentration in both a solid food matrix and a fluid carrier during supercritical carbon dioxide (SC-CO2) drying. The mass balance equations of the model involve five dimensionless parameters: Peclet number modified Sherwood number, Fourier number, mass ratio and equilibrium constant. The differential equations were discretized using the finite explicit difference method. The resulting model was implemented and solved in Matlab/Simulink using an explicit Runge-Kutta solver. A very good agreement (ARD = 7.2%) between experimental data, obtained by an independent group, and the present model was observed. The axial dispersion diffusion coefficient seems not to play a significant role during the drying process. A sensitivity analysis revealed that the predictions are relatively more sensitive to the equilibrium constant and the mass ratio than to Peclet and modified Sherwood numbers. Furthermore, in the case of Peclet and modified Sherwood numbers, the sensitivity and the uncertainty of the output are function of the final moisture content. The present model could be used as an optimization tool for kinetic studies to investigate the effects of different operation conditions on the performance and design of the supercritical drying technology.
Keywords: Mathematical model; Simulations; Supercritical carbon-dioxide; CO2; Sensitive analysis; Drying; Food; Packed beds

Mario F. Teisl, Sara B. Fein, Alan S. Levy, Information effects on consumer attitudes toward three food technologies: Organic production, biotechnology, and irradiation, Food Quality and Preference, In Press, Corrected Proof, Available online 11 July 2009, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2009.07.001.
(http://www.sciencedirect.com/science/article/B6T6T-4WRD3HJ-1/2/ab67705d20147a23f9325ed12e0da031)
Abstract:
It is important to understand how information supplied to consumers affects their attitudes about food technologies because these attitudes can impact market behavior. As technologies are actively promoted and cross-promoted, the relation between one's knowledge of, and attitude toward, a technology may well depend on the source of one's information. We examine the relation between knowledge and attitudes toward food technologies and find that greater self-rated knowledge of each technology is associated with positive attitudes about that technology. We also find strong negative cross-informational effects; increased knowledge of one technology leads to more negative attitudes of other technologies. This effect may be due to negative information being provided by opponents of specific technologies.
Keywords: Food safety; Environmental safety; Nutrition; Knowledge

Tracy E. Twine, Christopher J. Kucharik, Climate impacts on net primary productivity trends in natural and managed ecosystems of the central and eastern United States, Agricultural and Forest Meteorology, In Press, Corrected Proof, Available online 7 July 2009, ISSN 0168-1923, DOI: 10.1016/j.agrformet.2009.05.012.
(http://www.sciencedirect.com/science/article/B6V8W-4WPHRC6-1/2/3418166a277a909642ade7832fe291bb)
Abstract:
The central and eastern United States is an important food and timber production region and could potentially be a large-scale carbon sink. These characteristics are functions of the human management of the landscape and favorable soil and climate conditions. Large-scale assessments of carbon uptake and trends in net primary productivity (NPP) have been previously reported for this region using satellite observations, but they cannot quantify the contributions from changes in management and technology independently from climate effects. To address this shortcoming, we used the Agro-IBIS dynamic ecosystem model to examine the relationship of temperature and precipitation trends to NPP changes from 1950 to 2002 and 1982 to 2002 over both natural and managed ecosystems. In order to isolate the vegetation growth response to climate trends, we minimized the representation of management for agroecosystems and forested ecosystems by removing nitrogen stress and irrigation from the model. Simulated NPP trends were larger during 1982-2002 than during 1950-2002 and were positive across most of the domain. For the 1982-2002 period, corn had the largest NPP trend of 6.43 g C m-2 year-2 ($p = 0.22$), followed by soybean, spring wheat, deciduous forest, and grassland with 4.06 ($p = 0.30$), 4.05 ($p = 0.42$), 1.98 ($p = 0.17$), and 0.84 g C m-2 year-2 ($p = 0.73$), respectively. Winter wheat had a trend of -0.64 g C m-2 year-2 ($p = 0.55$) and evergreen needleleaf forest had a negligible NPP trend. Trends in NPP in grasslands, deciduous forest, spring wheat, and winter wheat were associated with trends in precipitation, while trends in corn and soybean were attributed to a combination of longer growing periods, decreased summer average temperatures, and increased precipitation. We found that 19% of corn and 11% of soybean NPP trends could be explained by temperature trends while 23% of corn and 44% of soybean trends could be explained by precipitation trends. Our results provide further evidence supporting observational results that suggest 20-25% of recent crop yield trends can be explained by changing climate, and suggest that over the past several decades climate changes have favored increased crop productivity in most agroecosystems of the central United States with the exception of winter wheat.

Keywords: Agro-IBIS; NPP; Climate; Modeling

Christophe Bene, Nelson Obirih-Opareh, Social and economic impacts of agricultural productivity intensification: The case of brush park fisheries in Lake Volta, Agricultural Systems, In Press, Corrected Proof, Available online 2 July 2009, ISSN 0308-521X, DOI: 10.1016/j.agsy.2009.06.001. (http://www.sciencedirect.com/science/article/B6T3W-4WNGDFP-1/2/35adde146b761666be52904638d41ab1)
Abstract:
The intensification of agricultural productivity through technological innovation has often been reported to induce considerable social and economic transformation in the rural communities where those innovations are introduced. This paper investigates those changes in the case of acadja, a particular technique for intensifying fishing, which has been adopted in various parts of the developing world. Using the case of Lake Volta in Ghana, the paper investigates the social and economic impacts of this technique, looking in particular into issues of income, assets and (re)distribution of the wealth created by those acadjas. Our analysis shows that the impact of acadjas on fishing communities is mixed. While acadja certainly helps to enhance the supply of protein-rich food and may have trickle down effects at the community level, those positive contributions are greatly reduced by other more negative effects. The data show in particular that acadjas are not a poor-neutral technology in the sense that their contribution to household income seems to benefit disproportionably the wealthiest owners. As such, acadja fisheries often create negative sentiments amongst the households who cannot afford investing in this technology, creating a situation which may lead to social tension and intra-community conflicts.
Keywords: Poverty; Rural development; Inland fisheries; Enclosure of the commons; Sub-Saharan Africa

Munir A. Hanjra, Tadele Ferede, Debel Gemechu Gutta, Reducing poverty in sub-Saharan Africa through investments in water and other priorities, Agricultural Water Management, Volume 96, Issue 7, July 2009, Pages 1062-1070, ISSN 0378-3774, DOI: 10.1016/j.agwat.2009.03.001. (http://www.sciencedirect.com/science/article/B6T3X-4W0SS8H-1/2/4de58a6b5511a6886014805f71203b86)
Abstract:
Water resources are essential to human development processes and to achieve the Millennium Development Goals that seek, inter alia, to eradicate extreme poverty and hunger, achieve universal literacy, and ensure environmental sustainability. Expanding irrigation is essential to increase agricultural production, which is needed to achieve economic development and attain food security in much of sub-Saharan Africa. Water resources and irrigated agriculture are not developed to their full potential. Currently less than 4% of renewable water resources in Africa are withdrawn for agriculture. Barriers include the lack of financial and human resources to build irrigation and related rural infrastructure and acquire agricultural technology, and inadequate access to markets. This constrains progress towards poverty reduction. We examine the linkages between agricultural water, education, markets and rural poverty through a review of published studies. We argue that, linking agricultural water, education, and market interventions, which are so often implemented separately, would generate more effective poverty reduction and hunger eradication programs. Investments in agricultural water management and complementary rural infrastructure and related policies are the pathways to break the poverty trap in smallholder African agriculture.
Keywords: Irrigation; Agricultural productivity; Poverty reduction; Farmer education; Rural infrastructure

J.R. Rogers, G.C. Townsend, T. Brown, Murray James Barrett, dental anthropologist: Yuendumu and beyond, HOMO - Journal of Comparative Human Biology, Volume 60, Issue 4, July 2009, Pages 295-306, ISSN 0018-442X, DOI: 10.1016/j.jchb.2009.03.002.
(http://www.sciencedirect.com/science/article/B7GW4-4W80CCH-1/2/6a06487353cf808c1505af07b233089d)
Abstract:
Murray James Barrett (1916-1975) graduated from the University of Adelaide's Bachelor of Dental Surgery programme in 1939 and subsequently became a colleague of Professor Thomas Draper Campbell (1893-1967). Campbell's passion for dental anthropology and his special interest in food habits and dental disease inspired Barrett to commence a longitudinal growth study in the 1960s of Aboriginal Australians living at Yuendumu in the Northern Territory of Australia. This study, referred to as the Dentgro project, involved the collection of dental records, growth data and cultural information about the Wailbri people.
Murray Barrett's application of computer technology enabled him to automate the entry of data derived from the Dentgro study and to develop programmes to analyse those data. The collection of dental casts (over 1700 serial casts for more than 450 individuals) and other records have provided a unique resource for research and teaching purposes. The casts have been in constant use for over 40 years providing insights into many aspects of dental development, including: the timing and sequence of tooth emergence; the nature and extent of variation in dental crown size and morphology in human populations; the patterns of growth in the dental arches over time; the range of occlusal variation between individuals; and the effects of wear on the dentition. The Yuendumu cast collection, representing a population with limited exposure to European customs and dietary habits, continues to attract the Adelaide School of Dentistry many interstate and overseas researchers interested in genetic and environmental influences on human dental development.

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

Cristina Bilbao-Sainz, Frank L. Younce, Barbara Rasco, Stephanie Clark, Protease stability in bovine milk under combined thermal-high hydrostatic pressure treatment, Innovative Food Science & Emerging Technologies, Volume 10, Issue 3, July 2009, Pages 314-320, ISSN 1466-8564, DOI: 10.1016/j.ifset.2009.01.003.
(http://www.sciencedirect.com/science/article/B6W6D-4VDY824-3/2/e02fb2f794c3957d62b1ee29666cb270)
Abstract:
At atmospheric pressure, inactivation of protease from B. subtilis in raw milk and pasteurized milk (with and without homogenization) was studied in a temperature range of 50-80 [degree sign]C. Thermal inactivation followed a first order kinetic model in the temperature range tested. Temperature dependence of the first order inactivation rate constants could be accurately described by the Arrhenius equation, allowing Ea values to be calculated. Different milk systems did not show differences in enzyme thermo stability.
The combined thermal (40, 50 and 60 [degree sign]C)-high hydrostatic pressure (300-450 and 600 MPa) effect on protease activity was studied. Protease was very resistant to high pressures. Pressure stability was higher in raw milk than in pasteurized milk; homogenization appeared to have a protective effect on the enzyme. The separate effects of pressure and temperature on enzyme inactivation were related to changes in L*-values and milk appearance.
A very pronounced antagonistic effect between high temperature and pressure was observed, i.e. at temperatures where thermal inactivation at atmospheric pressure occurs rapidly, application of pressure up to 600 MPa exerted a protective effect.Industrial relevance
High hydrostatic pressure (HHP) is an emerging technology that has been successfully applied as a minimal process for a variety of foods. Although the potential for the use of HHP treatment as an alternative method to heat treatment of milk was proposed almost a century ago, the suitability of this innovative technology to extend the shelf-life of milk hinges not only on its ability to inactivate pathogenic vegetative microorganisms but also on its effectiveness to inactivate indigenous and endogenous enzymes. This work examines the combined effects of temperature, pressure and homogenization on the protease (exogenous enzyme from B. subtilis) activity in milk. Inactivation of protease could extend the shelf life of milk.
Keywords: Protease; Thermal inactivation; High pressure; Bovine milk; Pasteurization; Homogenization

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

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

Ana Maria Aldanondo-Ochoa, Carmen Almansa-Saez, The private provision of public environment: Consumer preferences for organic production systems, Land Use Policy, Volume 26, Issue 3, July 2009, Pages 669-682, ISSN 0264-8377, DOI: 10.1016/j.landusepol.2008.09.006.
(http://www.sciencedirect.com/science/article/B6VB0-4TX188F-1/2/c08b26e14ea09b46eaced98bab8989ca)
Abstract:
This paper analyses individual preferences regarding environmental and health improvement technologies in organic food production systems. The impure public model is applied to explore the implications of organic food preferences for environmental market provision. Empirical results from a survey reveal that consumers are willing to pay for both health gains and environmental friendly technologies in organic milk production, although the valuation of the health aspects is higher. Prior information about organic production systems and shopping convenience are key variables in interpersonal comparisons of willingness to pay. The perceived overall value of organic production systems was higher among individuals with stronger environmental preferences than among those who prioritise health concerns. The conclusions of this study may have implications for the analysis of efficiency in the organic produce market.
Keywords: Impure public goods; Green labelling; Organic food; Willingness to pay; Contingent valuation; Health; Organic milk

Ademola K. Braimoh, Agricultural land-use change during economic reforms in Ghana, Land Use Policy, Volume 26, Issue 3, July 2009, Pages 763-771, ISSN 0264-8377, DOI: 10.1016/j.landusepol.2008.10.006.

(http://www.sciencedirect.com/science/article/B6VB0-4V0VC34-2/2/69309ded5295c6f13da0fc729e65f038)
Abstract:
Land-use change is driven by many interrelated factors including national policies formulated in response to the forces of globalization. This study integrates remote sensing data with social surveys to identify the role of demographic, technology and market-related variables in cropland expansion during economic reforms in Ghana. Macroeconomic changes increased the commercial orientation of farming as the sources of food supply changed from import to domestic production. However interest rates liberalization increased the use of labor at the expense of fertilizer and other complementary inputs. Demographic variables were more important in explaining cropland change after structural adjustment. Public agricultural support services are required for sustainable market-induced agricultural change in Ghana.
Keywords: Land-use change; Cropland; Structural adjustment; Economic reforms; Ghana

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.

Monica Anese, Michele Suman, M. Cristina Nicoli, Acrylamide removal from heated foods, Food Chemistry, In Press, Corrected Proof, Available online 26 June 2009, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2009.06.043.
(http://www.sciencedirect.com/science/article/B6T6R-4WM756P-4/2/acbdb33a74ea09883795167cc7cca82a)
Abstract:
The possibility to remove acrylamide from foods by exploiting its chemical physical properties was studied. Commercial biscuits and potato chips were subjected to vacuum treatments at different combinations of pressure, temperature and time. Results showed that acrylamide removal was achieved only in samples previously hydrated at water activity values higher than 0.83, and that, a maximum of acrylamide removal was obtained between 5 and 15 min of vacuum treatment at 6.67 Pa and 60 [degree sign]C. By applying these process conditions, it was possible to remove 43% and 18% acrylamide from the biscuits and the potato chips, respectively. It was hypothesised that the vacuum treatment could favour acrylamide formation by promoting the decarboxylation of the Schiff base, a key intermediate of acrylamide formation. Although further research is needed to find out for each food category the process conditions that can maximise acrylamide removal while minimising its formation as well as to evaluate the effects on the sensory properties, this technology would represent a promising and alternative strategy to mitigation interventions aimed at reducing acrylamide levels in foods.
Keywords: Acrylamide; Biscuits; Potato chips; Removal; Vacuum

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 (ClO2) and intense light pulses (ILP). Results showed that the selection of resistant cells was both species and technique dependent. While repetitive cycles of ClO2 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

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

Patricia Zimet, Yoav D. Livney, Beta-lactoglobulin and its nanocomplexes with pectin as vehicles for [omega]-3 polyunsaturated fatty acids, Food Hydrocolloids, Volume 23, Issue 4, Food Colloids: Creating Structure, Delivering Functionality, June 2009, Pages 1120-1126, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2008.10.008.
(http://www.sciencedirect.com/science/article/B6VP9-4TRCYK4-1/2/6e98ed8d5a796cd87a676fc0107166df)
Abstract:
The reduction of fat consumption calls for enrichment of non-fat foods and beverages with essential oil-soluble nutraceuticals, including [omega]-3 fatty acids. However, the low water-solubility and sensitivity to oxidation require new ways to solubilize and protect such sensitive compounds without compromising the desired sensory attributes of the enriched product. Beta-lactoglobulin ([beta]-Lg), the major whey protein of cow milk, is a natural molecular nano-carrier for hydrophobic molecules. The present work provides apparently first evidence for the spontaneous binding (Kb = (6.75 +/- 1.38) x 105 M-1) of docosahexaenoic acid (DHA) to [beta]-Lg. Based on a recent study from our group [Ron, N. (2007). [beta]-Lactoglobulin as a nano-capsular vehicle for hydrophobic nutraceuticals. M.Sc. thesis, Advisor: Dr. Yoav D. Livney, The Technion, Israel Institute of Technology, Haifa, Israel], we herein show the formation of colloidally stable nanocomplexes of DHA-loaded [beta]-Lg and low methoxyl pectin below the isoelectric point of [beta]-Lg (5.2), at pH = 4.5. By adding excess of pectin, negatively charged particles were formed containing ~166 times higher DHA concentration than the surrounding serum. This enabled the formation of dilutable nanoparticle dispersions, which formed transparent solutions containing 0.05% [beta]-Lg and DHA at a 1:2 ([beta]-Lg:DHA) molar ratio, with a very good colloidal stability and average particle size of ~100 nm. The entrapment by [beta]-Lg, and moreover, the formation of nanocomplexes with the pectin provided good protection against degradation of DHA during an accelerated shelf-life stress test: only about 5-10% lost during 100 h at 40 [degree sign]C, compared to about 80% lost when the unprotected DHA was monitored. This study presents a new way to nanoencapsulate long chain polyunsaturated fatty acids like DHA, useful for enrichment of clear acid drinks.
Keywords: Beta-lactoglobulin; DHA; [omega]-3; Anionic polysaccharide; Nanoencapsulation; Nutraceuticals

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

T. Jabbar, P. Akhter, K. Khan, A. Jabbar, K. Saleem, Radiological impact of composite food served at PINSTECH, Food and Chemical Toxicology, Volume 47, Issue 6, June 2009, Pages 1205-1208, ISSN 0278-6915, DOI: 10.1016/j.fct.2009.02.013.
(http://www.sciencedirect.com/science/article/B6T6P-4VNH45H-3/2/4a804334a7fe89bf8d77d274fc87dfa4)
Abstract:
To determine radiological impact of composite food served at Pakistan Institute of Nuclear Science and Technology (PINSTECH) on its worker, cooked meals were collected during 2000-2007 and analysed by gamma and beta radiometry techniques for naturally occurring radionuclides and fission fragments. The only measurable radionuclide was naturally occurring 40K. Its activity range was 40 +/- 1.5 to 182.4 +/- 3.8 Bq kg-1 with cumulative average value of 89.4 +/- 35.1 Bq kg-1. Based on annual meals taken by the worker in cafeteria, the measured value gives committed effective dose of 74 [mu] Sv and estimated cancer risk factor of 1.5 x 10-4 that is a minor fraction of the total risk of 5 x 10-3. It depicts that food served at PINSTECH cafeteria is radiologically safe for consumption.
Keywords: Composite food; Radiometry; 40K; Annual ingestion dose; Cancer risk

Kirsten Mattison, Julie Brassard, Marie-Josee Gagne, Pierre Ward, Alain Houde, Louise Lessard, Carole Simard, Anu Shukla, Franco Pagotto, Tineke H. Jones, Yvon-Louis Trottier, The feline calicivirus as a sample process control for the detection of food and waterborne RNA viruses, International Journal of Food Microbiology, Volume 132, Issue 1, 1 June 2009, Pages 73-77, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2009.04.002.
(http://www.sciencedirect.com/science/article/B6T7K-4W1JVW1-1/2/63092277418047ac8564144d65f110d0)
Abstract:
Many food and waterborne outbreaks of infectious disease are caused by viruses. While numerous methods exist and are being developed to test food and water for the presence of enteric viruses, there is no standard control for the comparison of different methods. Potential control viruses should be well characterized, share the physical characteristics of the enterically infecting viruses and not normally be associated with foods. Here, the feline calicivirus (FCV) is proposed as a sample process control for methods aimed at the extraction and detection of RNA viruses in food and water. FCV is shown to be useful as a control for the extraction of hepatitis A virus (HAV) from water using filtration technology and from strawberries using the Pathatrix(TM) system. The FCV standard provides a valuable quality control tool when testing potentially contaminated food samples.
Keywords: Hepatitis A virus; Feline calicivirus; Food virology

Christophe Boesch, Josephine Head, Martha M. Robbins, Complex tool sets for honey extraction among chimpanzees in Loango National Park, Gabon, Journal of Human Evolution, Volume 56, Issue 6, June 2009, Pages 560-569, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2009.04.001.
(http://www.sciencedirect.com/science/article/B6WJS-4WB377H-1/2/4956eacfc7afe50ac1f0e0a9a2f357e2)

Abstract:
Homo faber was once proposed as a label for humans specifically to highlight their unique propensity for tool use. However, new observations on complex tool use by the chimpanzees of Loango National Park, Gabon, expand our knowledge about tool-using abilities in Pan troglodytes. Chimpanzees in Loango, when using tools to extract honey from three types of bee nests, were observed to regularly use three- to five-element tool sets. In other words, different types of tools were used sequentially to access a single food source. Such tool sets included multi-function tools that present typical wear for two distinct uses. In addition, chimpanzees exploited underground bee nests and used ground-perforating tools to locate nest chambers that were not visible from the ground surface. These new observations concur with others from Central African chimpanzees to highlight the importance of honey extraction in arguments favoring the emergence of complex tool use in hominoids, including different tool types, expanded tool sets, multifunction tools, and the exploitation of underground resources. This last technique requires sophisticated cognitive abilities concerning unseen objects. A sequential analysis reveals a higher level of complexity in honey extraction than previously proposed for nut cracking or hunting tools, and compares with some technologies attributed to early hominins from the Early and Middle Stone Age. A better understanding of similarities in human and chimpanzee tool use will allow for a greater understanding of tool-using skills that are uniquely human.
Keywords: Chimpanzee; Tool use; Complexity; Cognition; Evolution

, Practice Paper of the American Dietetic Association: Home Care--Opportunities for Food and Nutrition Professionals, Journal of the American Dietetic Association, Volume 109, Issue 6, June 2009, Pages 1092-1100, ISSN 0002-8223, DOI: 10.1016/j.jada.2009.04.020.
(http://www.sciencedirect.com/science/article/B758G-4WBK4JJ-10/2/10cd79ee72c886246a8f03e7259c116a)
Abstract:
Home care continues to expand. With this growth are opportunities for registered dietitians (RDs) to demonstrate the vital role that they play not only in providing optimal nutrition care, but also in contributing to each patient's quality of life. Home care nutrition services range from individual patient counseling to managing and monitoring parenteral nutrition. RDs' knowledge of nutrition, reimbursement, and new technologies position them to improve care and control costs. Current roles and responsibilities along with emerging areas of professional growth give RDs a multitude of options to provide and expand their services and value in home care.

Donald C. Weber, Jonathan G. Lundgren, Assessing the trophic ecology of the Coccinellidae: Their roles as predators and as prey, Biological Control, In Press, Corrected Proof, Available online 30 May 2009, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2009.05.013.
(http://www.sciencedirect.com/science/article/B6WBP-4WDGCPR-4/2/dbb3c6edbf65b9380f7a4431bd7d444d)
Abstract:
Coccinellidae function in complex food webs as predators, as consumers of non-prey foods, and as prey or hosts of natural enemies. Dietary breadth and its implications remain largely unexplored. Likewise the nature and implications of interactions with other predators in the field are poorly understood. The use of biochemical tools based on nucleic acids, proteins, sugars and other components of coccinellid diets, expands our understanding of their trophic ecology - but only under field conditions in which coccinellids live, reproduce, forage, and consume prey (including intraguild prey), pollen, fungi, nectars, and other foods. We review the various methods which have been applied to the study of trophic relationships involving the Coccinellidae, their advantages and disadvantages, and some salient innovations and results produced by the range of technologies and their combinations. We advocate employing multiple tools to generate a more complete picture of the trophic ecology of a predator. The false perceptions of the strength and

direction of trophic linkages that can result from a methodologically narrow approach are well illustrated by the laboratory and field assessments of coccinellids as intraguild predators, a phenomenon that is discussed in detail here. Assessing intraguild predation, and the breadth of prey and non-prey foods of the Coccinellidae, is essential to the understanding of this group, and for their application as biological control agents.
Keywords: Biological control; Food web; Intraguild predation; Lady beetle; Nutrition; Predator; Gut analysis; PCR; Immunoassay; Isotopic analysis; Alkaloids

Michael Popp, Liesbeth Van de Velde, Gina Vickery, Guido Van Huylenbroeck, Wim Verbeke, Bruce Dixon, Determinants of consumer interest in fuel economy: Lessons for strengthening the conservation argument, Biomass and Bioenergy, Volume 33, Issue 5, May 2009, Pages 768-778, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2008.12.007.
(http://www.sciencedirect.com/science/article/B6V22-4VH330D-1/2/a2ef757d1eb446dcc7a2335b75f43f1e)
Abstract:
With an outlook for higher global energy prices and concomitant increase of agricultural resources for the pursuit of fuel, consumers are expected to seek more fuel-economic transportation alternatives. This paper examines factors that influence the importance consumers place on fuel economy, with attention given to differences between American and European consumers. In a survey conducted simultaneously in the United States (U.S.) and Belgium in the fall of 2006, respondents in both countries ranked fuel economy high among characteristics considered when purchasing a new vehicle. Overall, respondents in the U.S. placed greater emphasis on fuel economy as a new-vehicle characteristic. Respondents' budgetary concerns carried a large weight when purchasing a new vehicle as reflected in their consideration of a fuel's relative price (e.g. gasoline vs. diesel vs. biofuel) and associated car repair and maintenance costs. On the other hand, high-income Americans displayed a lack of concern over fuel economy. Concern over the environment also played a role since consumers who felt empowered to affect the environment with their purchasing decisions (buying low and clean emission technology and fuels) placed greater importance on fuel economy. No statistically significant effects on fuel economy rankings were found related to vehicle performance, socio-demographic parameters of age, gender or education. Importantly, the tradeoff between using agricultural inputs for energy rather than for food, feed and fiber had no impact on concerns over fuel economy. Finally, contrary to expectations, U.S. respondents who valued domestically produced renewable fuels did not tend to value fuel economy.
Keywords: Fuel economy; Fuel efficiency; Consumer perceptions; Food vs. fuel tradeoff

Hui Yu, Guo H. Huang, Corrigendum to 'Effects of sodium acetate as a pH control amendment on the composting of food waste' [Bioresource Technology 100 (6) (2009) 2005-2011], Bioresource Technology, Volume 100, Issue 10, May 2009, Page 2745, ISSN 0960-8524, DOI: 10.1016/j.biortech.2009.02.013.
(http://www.sciencedirect.com/science/article/B6V24-4VRRXYG-2/2/d83104f586017cda60b1437100504e65)

Judith Bretag, Dietmar R. Kammerer, Uwe Jensen, Reinhold Carle, Adsorption of rutin onto a food-grade styrene-divinylbenzene copolymer in a model system, Food Chemistry, Volume 114, Issue 1, 1 May 2009, Pages 151-160, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.09.034.
(http://www.sciencedirect.com/science/article/B6T6R-4TG9J0N-3/2/8252b095081f84c4c716c5973f16c590)
Abstract:
Adsorption of quercetin-3-O-rutinoside (rutin) onto Amberlite(R) XAD 16HP was studied applying a modified D-optimal design. Temperature, pH value, rutin concentration and resin amount were

studied as independent factors determining rutin adsorption. Using the mathematical model resulting from the analysis of the D-optimal design the optimal conditions for rutin adsorption onto the styrene-divinylbenzene copolymer were determined. Furthermore, the model equation was successfully applied to calculate the Langmuir and Freundlich isotherm parameters of this particular solute-sorbent system. In addition, the data obtained from the D-optimal design allowed the calculation of [Delta]G, [Delta]H and [Delta]S for the adsorption process. The results presented in this study are of utmost importance for a better understanding of adsorption phenomena. The more detailed knowledge of such sorbent systems is required to improve the cost-effectiveness of industrial processes for the recovery of secondary plant metabolites, such as polyphenols, based on resin adsorption technology.
Keywords: Adsorption; Amberlite(R) XAD 16HP; Modified D-optimal design; Polyphenols; Rutin; Free energy; Enthalpy; Entropy

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

R. Simpson, C. Acevedo, S. Almonacid, Mass transfer of CO2 in MAP systems: Advances for non-respiring foods, Journal of Food Engineering, Volume 92, Issue 2, May 2009, Pages 233-239, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.10.035.
(http://www.sciencedirect.com/science/article/B6T8J-4TW10BY-3/2/f9fc82c2e349838b67ae499f00e6d9af)
Abstract:
The use of technologies that modify food environment for preservation purposes has been extensively studied in the past two decades. Even though technological advances have been made, most of the modified atmosphere packaging (MAP) development has been empirical.

In this short communication, a revision of general equations of mass transfer and criteria to design MAP systems was carried out. Mathematical relationships and models to evaluate the flux of CO2 for the packaging of non-respiring foods are discussed. Data to predict CO2 uptake for the food, such as solubility and diffusion in refrigerated MAP systems are given.
Keywords: MAP systems; Non-respiring foods; Carbon dioxide; Mass transfer

Rebecca A. Gould, Deborah Canter, Management Matters, Journal of the American Dietetic Association, Volume 109, Issue 5, Supplement 1, Marketing Yourself: Enhance Your Profile and Advance Your Career, May 2009, Pages S29-S31, ISSN 0002-8223, DOI: 10.1016/j.jada.2009.03.033.
(http://www.sciencedirect.com/science/article/B758G-4W39NVV-D/2/c221b90b8c796732d65f2d90340c120e)
Abstract:
Fewer than 50% of registered dietitians (RDs) supervise personnel and 76% have no budget authority. Because higher salaries are tied to increasing levels of authority and responsibility, RDs must seek management and leadership roles to enjoy the increased remuneration tied to such positions. Advanced-level practice in any area of dietetics demands powerful communication abilities, proficiency in budgeting and finance, comfort with technology, higher-order decision-making/problem-solving skills, and well-honed human resource management capabilities, all foundational to competent management practice. As RDs envision the future of the dietetics profession, practitioners must evaluate management competence in both hard and soft skills. Just as research is needed to support evidenced-based clinical practice, the same is needed to support management practice across the profession. Dietetics educators and preceptors should be as enthusiastic about management practice as they are clinical practice when educating and mentoring future professionals. Such encouragement and support can mean that new RDs and dietetic technicians, registered, will understand what it takes to advance to higher levels of responsibility, authority, and subsequent enhanced remuneration. In the ever-changing social, legal, ethical, political, economic, technological, and ecological environments of work, food and nutrition professionals who are willing to step forward and assume the risks and responsibilities of management also will share in the rewards, and propel the profession to new heights of recognition and respect.

Shenglei Fu, Xiaoming Zou, David Coleman, Highlights and perspectives of soil biology and ecology research in China, Soil Biology and Biochemistry, Volume 41, Issue 5, Science Goes Underground in China, May 2009, Pages 868-876, ISSN 0038-0717, DOI: 10.1016/j.soilbio.2008.10.014.
(http://www.sciencedirect.com/science/article/B6TC7-4TVR73D-4/2/7c75ceef37f1feb044278e31375667f1)
Abstract:
As seen for the publications in several distinguished soil related journals, soil biology and ecology is booming in China in recent years. This review highlights the major findings of the soil biology and ecology projects conducted in China during the past two decades. Special attention is paid on the responses of soil biota to environmental change, and the roles of soil functional groups in C transformation, nutrient cycling and pollution remediation. We also point out the future challenges facing the Chinese soil biologists and soil ecologists. In the future, more systematic studies rather than scattered case studies are needed, more controlled field experiments rather than short-term laboratory studies should be encouraged. Besides, we need to focus more on the linkage between aboveground and belowground organisms, the interactions between different groups of soil food web, and the coupling of observation with modeling. It is essential to employ the state-of-the-art technology in research of soil biology and ecology because to answer the emerging scientific questions relies heavily on the development of new technology. Our ultimate goals are to push

forward the research on soil biology and ecology in China and to encourage the interaction and collaboration between the international community and research groups in China.
Keywords: China; Belowground; Rhizosphere; Soil fauna; Soil organisms; Soil food web

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.

Tommaso Russo, Clara Boglione, Paolo De Marzi, Stefano Cataudella, Feeding preferences of the dusky grouper (Epinephelus marginatus, Lowe 1834) larvae reared in semi-intensive conditions: A contribution addressing the domestication of this species, Aquaculture, Volume 289, Issues 3-4, 16 April 2009, Pages 289-296, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2009.01.021.
(http://www.sciencedirect.com/science/article/B6T4D-4VH8B0H-2/2/0135c4198b8759ace4b6a5003336cea4)
Abstract:
Despite research efforts addressing artificial propagation, dusky grouper aquaculture still relies on experimental trials owing to the low survival rates of larvae and juveniles, thus rendering mass rearing difficult to attain. Although some authors suggested that the preys offered to the early larval stages represent the major problem facing the rearing of all grouper species, very little information is available in literature on larval development and the behaviour of dusky grouper. The objective of this study was to investigate the trophic preferences of larval stages of the dusky grouper by rearing using a semi-intensive technology. Larvae were reared in pilot scale mesocosms (60 m3) from 3 to 35 days post hatching. The rearing system was supplied with wild zooplankton collected in a natural coastal lagoon in order to augment the chances of satisfying the larvae's feeding requirements; the feeding preferences were analyzed during ontogenesis. The relationship between mouth gape and dimensions of preys, considered as 3-D objects, was investigated to identify possible critical factor.
The results of this study suggested a sequence of suitable food items from the beginning of exogenous feeding until day 35 post hatching. In particular, dusky grouper larvae actively select copepod nauplii in the size range between 2 and 12 mm in TL, and Artemia salina nauplii for TL larger than 9 mm. The rearing approach applied seemed to be promising. Indeed, while previous rearing trials of dusky grouper failed within ten days or finished at 30 days post hatching with a lower percent of survivors, this paper reports the best survival rate reported for this species (10% +/- 7.0 survivors at 35 days post hatching). Finally, mouth width was observed to be the limiting factor in the selection of prey, while the smallest prey size plays a critical role in determining ingestion. Our results contribute to clarifying some aspects of the larval ecology of this species, furnishing some suggestions for its cultivation.
Keywords: Fish larvae; Development; Epinephelus marginatus; Trophic ecology; Mouth gape

Hans-Peter Weikard, Demet Seyhan, Distribution of phosphorus resources between rich and poor countries: The effect of recycling, Ecological Economics, Volume 68, Issue 6, Eco-efficiency: From technical optimisation to reflective sustainability analysis, 15 April 2009, Pages 1749-1755, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2008.11.006.
(http://www.sciencedirect.com/science/article/B6VDY-4V3HMDP-3/2/8537a1fca949c3ce0bc2801ab43effca)
Abstract:
Phosphorus (P) is an essential input into agriculture with no substitute. Thus international and intertemporal P allocations greatly impact food security which requires increased food production for a growing world population. As high quality phosphorus mines are being depleted, recycling gains importance and developed countries explore new technologies for P recycling. We analyse the effects of P recycling in developed countries on global extraction of rock phosphates and the imports of developing countries. We build a resource extraction model for a competitive fertilizer market that reflects the fact that most developed countries have P-saturated soils while soils in many developing countries are P-deficient. Our model extends a simple cake eating problem. We consider two types of countries that differ in demand and recycling options. We find that P recycling in developed countries does not only prolong the resource life-time, but it also increases the developing counties' share of the resource.
Keywords: Non-renewable resources; Essential resources; Phosphate mining; Recycling; Distribution of resources

Lars Hinrichsen, Manufacturing technology in the Danish pig slaughter industry, Meat Science, In Press, Corrected Proof, Available online 7 April 2009, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2009.03.012.
(http://www.sciencedirect.com/science/article/B6T9G-4W15KXB-1/2/868651f6e3eb5e07206245c11ae76d59)
Abstract:
The Danish pig meat industry is very export oriented. Ninety per cent of the production of the big cooperative slaughterhouses is exported to more than 100 countries all over the world. This poses a requirement for the industry to be globally competitive in the sense of quality, product safety and - of course - price.
A big challenge for the industry is therefore to maintain sufficient low unit costs in spite of the high factor costs of Denmark. In particular the high labour costs must be accompanied by correspondingly high labour productivity. And, it should be emphasized, this high labour productivity must be achieved without compromising the concern for good working conditions of the employees in the manufacturing. Technology is one of the means to achieve this combination of good working conditions and high labour productivity.
One of the most important benefits from automation is the improved working environment. Pig slaughtering, cutting and boning is traditionally very labour intensive and requires hard and repetitive work. For many people a job in a slaughterhouse is therefore not their first choice. This situation can be changed by automation, which will not only reduce arduous and repetitive work but in addition will introduce more motivating jobs in terms of planning, supervision and control of the new technology.
Automation will also improve the hygiene and thereby the food safety. This applies in particular to the clean slaughter line where cross contamination between carcasses is reduced because of less manual handling and because the tools in the machines can be sterilised more effectively between each carcass.
Automated processes are more accurate and repeatable than manual work. For some processes, in particular in cutting and boning, this will enhance the product yield.
New technology can also improve the animal welfare. The group-stunning system and mechanised lairage systems are examples of that. Improved animal welfare has an ethical value in itself and

also a value in terms of the enhanced meat quality resulting from the more considerate treatment of the animals.
Keywords: Technology; Pig slaughter; Automation; Management

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

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

Rajeev K Varshney, Timothy J Close, Nagendra K Singh, David A Hoisington, Douglas R Cook, Orphan legume crops enter the genomics era!, Current Opinion in Plant Biology, Volume 12, Issue 2, Genome Studies and Molecular Genetics - Edited by Masahiro Yano and Roberto Tuberosa, April 2009, Pages 202-210, ISSN 1369-5266, DOI: 10.1016/j.pbi.2008.12.004.
(http://www.sciencedirect.com/science/article/B6VS4-4VDS484-2/2/c67de3e50669ee973fe714f24f00b4be)
Abstract:
Many of the world's most important food legumes are grown in arid and semi-arid regions of Africa and Asia, where crop productivity is hampered by biotic and abiotic stresses. Until recently, these crops have also suffered from a dearth of genomic and molecular-genetic resources and thus were `orphans' of the genome revolution. However, the community of legume researchers has begun a concerted effort to change this situation. The driving force is a series of international collaborations that benefit from recent advances in genome sequencing and genotyping technologies. The focus of these activities is the development of genome-scale data sets that can be used in high-throughput approaches to facilitate genomics-assisted breeding in these legumes.

Elke Rauscher-Gabernig, Roland Grossgut, Friedrich Bauer, Peter Paulsen, Assessment of alimentary histamine exposure of consumers in Austria and development of tolerable levels in typical foods, Food Control, Volume 20, Issue 4, April 2009, Pages 423-429, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.07.011.
(http://www.sciencedirect.com/science/article/B6T6S-4T13CH0-2/2/f91ba9fe883e3769004e7886e084b19e)
Abstract:
Although alimentary intake of histamine can cause intoxication, legal limits for histamine content in the EU, exist for certain seafish species only. The present study suggests tolerable levels for fermented sausage, fish and cheese which are based on relating the amount of histamine not expected to cause any health effects after ingestion to typically consumed amounts of food. Limits of 500 and 400 mg/kg would seem to be justifiable for fermented sausage and cheese, respectively. For fish species other than those already regulated in EU, the 'm'/'M' limits of 100 and 200 mg/kg can be adopted. These limits can be met by current food technology.
Keywords: Histamine; Risk assessment; Tolerance levels; Fish; Cheese; Sausage

J.A. Hernandez, Optimum operating conditions for heat and mass transfer in foodstuffs drying by means of neural network inverse, Food Control, Volume 20, Issue 4, April 2009, Pages 435-438, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.07.005.
(http://www.sciencedirect.com/science/article/B6T6S-4T0MMFV-4/2/3194c23d59374acac1f5d3dcf42e4be8)
Abstract:
Artificial neural network inverse (ANNi) is applied to optimize the operating conditions on heat and mass transfer during foodstuffs drying. This proposed method (ANNi) inverts the artificial neural network (ANN) and uses the Nelder-Mead simplex method of optimization to find the optimum parameter value (or unknown parameter) for given required conditions. In the aim to demonstrate this ANNi method, two separate feedforward networks (ANN) with one hidden layer reported by Hernandez-Perez, Garcia-Alvarado, Trystram, and Heyd [Hernandez-Perez, J.A., Garcia-Alvarado, M.A., Trystram, G., & Heyd, B. (2004). Neural networks for the heat and mass transfer

prediction during drying of cassava and mango. Innovative Food Science and Emerging Technologies, 5, 56-64], were used in order to obtain temperature and moisture kinetics simulations during the drying of mango and cassava. These reported models take into account air temperature, air velocity, shrinkage as a function of moisture content, time and air humidity as well-known input parameters. Levenberg-Marquardt learning algorithm, hyperbolic tangent sigmoid transfer-function, linear transfer-function and three neurons in the hidden layer were considered in both reported models. Results of the ANNi showed a good agreement with the experimental and simulated data . Then ANNi could be applied to determine the optimal parameters during mango and cassava drying with elapsed time minor to 0.3 s. In addition, this methodology can be used to controlling the drying process.
Keywords: Neural network inverse; Heat and mass transfer; Drying; Cassava; Mango; Optimal parameters

J. Gomez-Estaca, M.E. Lopez-Caballero, M.C. Gomez-Guillen, A. Lopez de Lacey, P. Montero, High pressure technology as a tool to obtain high quality carpaccio and carpaccio-like products from fish, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 148-154, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.10.006.
(http://www.sciencedirect.com/science/article/B6W6D-4TTHWD5-3/2/2e53c0198d78e2151873d79db8be768b)
Abstract:
This work evaluates the physicochemical and sensorial qualities of salmon, tuna and desalted 'bacalao', thinly sliced as carpaccios, and subjected to 15-min of continuous pressure and pulsed pressure in three 5-min steps (200-300 MPa at 7 [degree sign]C). Pressurization of salmon and tuna gave rise to an increase in the shear strength of carpaccios, a reduction of the water and lipid binding properties and an increase in the total colour difference. Though these changes were also detected by the sensory panel, the resulting pressurized products obtained high scores for acceptability. Desalted 'bacalao' carpaccio was more stable under high pressure and sensory analysis revealed that in most treatments the raw attributes had been retained. The results obtained by applying pressure in one or three consecutive cycles were, in general, the same. High-pressure treatment was shown to be an adequate tool for obtaining high-quality desalted 'bacalao' carpaccio, whereas salmon and tuna suffered a loss of raw attributes. However the resulting products acquired new sensory features which were highly accepted by the sensory panel.Industrial relevance
Nowadays, there is a growing interest in consuming raw or minimally processed foods and among fishery products, carpaccio are becoming increasingly popular. The present work deals with the effect of high pressure on the physico-chemical and sensory attributes of carpaccios made from salmon, tuna, and desalted 'bacalao'. High pressure may be an adequate tool to obtain high quality carpaccio or carpaccio-like products, as the products acquired new sensory features which were highly accepted by the sensory panel. From the industry viewpoint the application of high pressure to fish carpaccios may be appealing in a two way: firstly, the resulting carpaccio are presumably free of parasites and present a better microbiological quality, thereby increasing the shelf-life. Secondly, products may acquire new sensory attributes that can be very appreciated by consumers.
Keywords: High pressure; Carpaccio; Carpaccio-like products; Fish

K. Nagendra Prasad, En Yang, Chun Yi, Mouming Zhao, Yueming Jiang, Effects of high pressure extraction on the extraction yield, total phenolic content and antioxidant activity of longan fruit pericarp, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 155-159, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.11.007.
(http://www.sciencedirect.com/science/article/B6W6D-4V17CRW-2/2/2c56ba4b1ff3188a8c2b8cda6ea0e847)

Abstract:
High pressure extraction (HPE) was carried out to extract phenolic compounds from longan fruit pericarp. The influence of different solvents, solvent concentration (25-100%, v/v), solid to liquid ratio (1:25-1:100, w/v) were individually determined using these optimum extraction conditions. HPE was carried out at various pressures (200-500 MPa), durations (2.5-30 min) and temperatures (30-70 [degree sign]C). The extraction yield, total phenolic contents and scavenging activities of superoxide anion radical and 1,1-dipheny l-2-picrylhydrazyl (DPPH) radical of HPE extract were examined and then compared with those of the conventional extraction (CE). The application of HPE obtained a higher extraction yield and required a less extraction time when compared to CE. Furthermore, the total phenolic contents and the antioxidant activities of HPE extract were higher than CE extract. This study indicated that this new technology can benefit the food and pharmaceutical industries.Industrial relevance
This study focused on the evaluations of the extraction yield, total phenolic content and antioxidant activity of longan fruit pericarp by high pressure treatment. The high pressure extraction technology provided a better way of utilizing longan fruit pericarp as a readily accessible source of natural antioxidants in food and pharmaceutical industries.
Keywords: Antioxidant; Extraction yield; High pressure; Longan fruit; Phenolics

Alessandra L. Oliveira, Eliana S. Kamimura, Jose A. Rabi, Response surface analysis of extract yield and flavour intensity of Brazilian cherry (Eugenia uniflora L.) obtained by supercritical carbon dioxide extraction, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 189-194, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.11.002.
(http://www.sciencedirect.com/science/article/B6W6D-4TXF809-1/2/0a9ad07bf1526dfc8228dd20904d850a)
Abstract:
This work evaluated the effect of pressure and temperature on yield and characteristic flavour intensity of Brazilian cherry (Eugenia uniflora L.) extracts obtained by supercritical CO2 using response surface analysis, which is a simple and efficient method for first inquiries. A complete central composite 22 factorial experimental design was applied using temperature (ranging from 40 to 60 [degree sign]C) and pressure (from 150 to 250 bar) as independent variables. A second order model proved to be predictive ($p <= 0.05$) for the extract yield as affected by pressure and temperature, with better results being achieved at the central point (200 bar and 50 [degree sign]C). For the flavour intensity, a first order model proved to be predictive ($p <= 0.05$) showing the influence of temperature. Greater characteristic flavour intensity in extracts was obtained for relatively high temperature (> 50 [degree sign]C). Therefore, as far as Brazilian cherry is concerned, optimum conditions for achieving higher extract yield do not necessarily coincide to those for obtaining richer flavour intensity.Industrial relevance
Supercritical fluid extraction (SFE) is an emerging clean technology through which one may obtain extracts free from organic solvents. Extract yields from natural products for applications in food, pharmaceutical and cosmetic industries have been widely disseminated in the literature. Accordingly, two lines of research have industrial relevance, namely, (i) operational optimization studies for high SFE yields and (ii) investigation on important properties extracts are expected to present (so as to define their prospective industrial application). Specifically, this work studied the optimization of SFE process to obtain extracts from a tropical fruit showing high intensity of its characteristic flavour, aiming at promoting its application in natural aroma enrichment of processed foods.
Keywords: Brazilian cherry; Natural extracts; Supercritical fluid extraction; Sensory analysis; Response surface analysis

Andreja Rajkovic, Mieke Uyttendaele, Nancy Van Houteghem, Sandra Maria Oses Gomez, Johan Debevere, Frank Devlieghere, Influence of partial inactivation on growth of Listeria

monocytogenes under sub-optimal conditions of increased NaCl concentration or increased acidity, Innovative Food Science & Emerging Technologies, Volume 10, Issue 2, April 2009, Pages 267-271, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.11.011.
(http://www.sciencedirect.com/science/article/B6W6D-4V3HFC0-1/2/52499aca1a6fff8b7d6ef2bb3ad22a98)
Abstract:
The effect of partial inactivation with lactic acid (LA), liquid chlorine dioxide (ClO2) and intense light pulses (ILP) on injury and post-treatment growth under increased NaCl concentration and reduced pH values of Listeria monocytogenes strains was investigated. Inactivation levels and the percentage of sub-lethal were dependent upon strain and type of inactivation technique used. Comparison of the mean time-to-detection (TTD) values under suboptimal conditions (increased NaCl concentration or reduced pH) showed that the longest TTD was at every pH observed for the cultures treated with ClO2, followed by LA and ILP. Under increased NaCl concentration LA treated cells required the longest TTD, followed by ClO2 and ILP, respectively. Significant difference in TTD between untreated and cultures treated with ClO2 and LA was observed. Recovery of ILP treated cultures was not always different from untreated cultures. The extended post-treatment effect based on the growth retardation or inhibition of injured cells under sub-optimal conditions is suggested as an important tool in conditioning of microbial food safety.Industrial relevance
Small and medium sized enterprises (SMEs) are the backbone of the European economy. They are a key source of jobs and a breeding ground for implementation of research results. They are however the most sensitive of all to changes in the production practices coming as a consequence of increased consumers' awareness regarding fresh and natural-like foods. In order to respond to the changed consumption pattern, non-heat and so-called mild technologies have emerged. This research as a part of the EU Pathogen Combat project is tailor made to answer some of the burning issues when it comes to 'mild' decontamination. Among the more established technologies used here is decontamination with lactic acid, followed by chlorine dioxide. Both are now under the eye of EU policy makers who are seeking relevant facts to adjust or not to adjust EU policy regarding decontamination of foods. Latest EFSA opinions have already pushed these agents forward, but relevant scientific facts were declared missing. Moreover, intense light pulses, as non-chemical alternative to pasteurization have a considerable potential not only in food surface decontamination, but also in the decontamination of packaging materials, industrial surfaces etc. The present research brought new facts into the light that might have a credible influence on understanding pros and cons of lactic acid, chlorine dioxide and intense light pulses as decontamination agents. The post-treatment, based on sublethal injury, effect is suggested as an important extension tool in shelf life extension and safety barrier.
Keywords: Listeria monocytogenes; Mild preservation; Injury; Stress; Acid; Salt; Resuscitation

Francesco Marra, Lu Zhang, James G. Lyng, Radio frequency treatment of foods: Review of recent advances, Journal of Food Engineering, Volume 91, Issue 4, April 2009, Pages 497-508, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.10.015.
(http://www.sciencedirect.com/science/article/B6T8J-4TTMJJ2-2/2/e36df48973269a75e13ccc45fdaa0131)
Abstract:
Radio frequency (RF) heating is a technology on which quite a number of publications have emerged in recent years. The current paper reviews the history of this form of heating and introduces the basic principle of this technology including how it is applied and how it differs from other forms of heating. Recent literature on RF heating applications is examined, highlighting the impact of this form of heating on general quality aspects of foods. An understanding of physical characteristics which influence food heating including geometry, shape, product position and dielectric properties is extremely important in the design of RF heating systems and recent

publications in these areas are discussed in addition to the most recent developments on mathematical modelling. In the final section the authors give their opinion on future trends and prospects for this form of heating.
Keywords: Radio frequency; Food quality; Dielectric properties; Modelling

Hannu Korhonen, Milk-derived bioactive peptides: From science to applications, Journal of Functional Foods, Volume 1, Issue 2, April 2009, Pages 177-187, ISSN 1756-4646, DOI: 10.1016/j.jff.2009.01.007.
(http://www.sciencedirect.com/science/article/B9848-4VS3PB2-1/2/49c12bb1d7fe67a0bd98ff833fe74c54)
Abstract:
Milk proteins have received increasing attention as potential ingredients of health-promoting functional foods targeted at diet-related chronic diseases, such as cardiovascular disease, diabetes type two and obesity. To this end, growing interest has been focused on physiologically active peptides derived from milk proteins. These peptides are inactive within the sequence of the parent protein molecule and can be liberated by gastrointestinal digestion of milk, fermentation of milk with proteolytic starter cultures or hydrolysis by proteolytic enzymes. Milk protein-derived peptides have been shown under in vitro and in vivo conditions to exert a number of activities affecting the digestive, endocrine, cardiovascular, immune and nervous systems. A great variety of naturally formed bioactive peptides have been found in fermented dairy products, such as yoghurt, sour milk and cheese. Recently, industrial-scale technologies suitable for the industrial production of bioactive milk peptides have been developed. In addition, a few commercial food products supplemented with milk protein-derived bioactive peptides have been launched on limited markets. Some of these products carry clinically documented benefits, in particular for reduction of mild hypertension. The multifunctional properties of milk peptides appear to offer considerable potential for the development of many similar products in the near future.
Keywords: Milk proteins; Bioactive peptides; Production; Functionality; Applications

Mohammed Aider, Damien de Halleux, Cryoconcentration technology in the bio-food industry: Principles and applications, LWT - Food Science and Technology, Volume 42, Issue 3, April 2009, Pages 679-685, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.08.013.
(http://www.sciencedirect.com/science/article/B6WMV-4TG35PX-1/2/e29d696bc3c812a8ab002eca85eb1d77)
Abstract:
Cryoconcentration is a natural phenomenon which occurs during the ice thawing. More concentrated phase is then separated from the initial solution. This phenomenon was exploited for scientific objectives and the results were impressive. The use of the cryoconcentration technology in the bio-food industry makes it possible to obtain products of high nutritive, biological and organoleptic value. The aim of this review was to trace a detailed synthesis of the basic principles of this concentration and extraction technique, to summarize in one document the potential and principal applications reported in the literature and to try to predict the future and the necessary conditions for the industrial success of this technology.
Keywords: Cryoconcentration; Food technology; Principles; Applications

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

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.

B.K. Tiwari, C.P. O' Donnell, P.J. Cullen, New challenges in food science and technology: an industrial perspective, Trends in Food Science & Technology, Volume 20, Issues 3-4, April 2009, Pages 180-181, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.02.002.
(http://www.sciencedirect.com/science/article/B6VHY-4VKXC12-1/2/6cfc4b50075ff16763b5482a103f19c9)

Howard Davies, A role for 'omics' technologies in food safety assessment, Food Control, In Press, Corrected Proof, Available online 21 March 2009, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2009.03.002.
(http://www.sciencedirect.com/science/article/B6T6S-4VWHW02-2/2/f071e762d272c141d00c2d88729904a0)
Abstract:
Risk assessment frameworks, such as those used for GM crops, have detailed comparative analysis with appropriate non-GM counterparts as their cornerstone. Opinions have been voiced that current analytical approaches are too specific and need to be complemented by more unbiased, larger scale analysis of gene expression and protein expression using transcriptomics and proteomics, respectively. In parallel, the use of metabolomics has been advocated as an approach to expand significantly the range of metabolites that can be measured to assess more stringently the potential for any unintended effects. Transcriptomics, proteomics and metabolomics have been termed collectively 'omics' technologies. This review assesses the potential for using 'omics' techniques in risk assessment. Importantly, the review provides information on sources of

natural variation which can result from crop management practices, from interactions between genotype and growing environment and from non-GM breeding systems. This provides an important benchmark for risk assessors and risk managers.
Keywords: Genomics; Transcriptomics; Proteomics; Metabolomics; Omics; Food safety; GM

C.E. Pope, E.G. Crichton, M.C. Gomez, C. Dumas, B.L. Dresser, Birth of domestic cat kittens of predetermined sex after transfer of embryos produced by in vitro fertilization of oocytes with flow-sorted sperm, Theriogenology, Volume 71, Issue 5, 15 March 2009, Pages 864-871, ISSN 0093-691X, DOI: 10.1016/j.theriogenology.2008.10.012.
(http://www.sciencedirect.com/science/article/B6TCM-4VBC5JH-1/2/146a2928ae3a1502d00965c004119666)
Abstract:
Our goals were to: (1) determine if domestic cat sperm could be sorted to high purity by flow cytometry after overnight shipment of cooled samples; (2) evaluate the efficiency with which sorted sperm could be used to generate cat embryos in vitro; and (3) determine if live kittens of predetermined sex could be produced after transfer of embryos derived by IVF using sorted sperm. Semen samples (n = 5) from one male were extended in electrolyte-free solution and shipped overnight at 4 [degree sign]C to the sorting facility. Samples were adjusted to 75 x 106 sperm/mL and stained with Hoechst 33342. After 1 h at 34.5 [degree sign]C, samples were adjusted to 50 x 106 sperm/mL with 4% egg yolk TALP + 0.002% food dye and sorted by high-speed flow cytometry. Later resort analysis confirmed purities of 94% and 83% for X- and Y-chromosome bearing sperm, respectively. Sorted sperm were centrifuged, re-suspended in TEST yolk buffer and shipped overnight to the IVF laboratory. After IVF of in vivo matured oocytes with X-chromosome bearing sperm, cleavage frequency was 62% (54/87). After IVF of IVM oocytes with control, X- or Y-chromosome bearing sperm, the incidence of cleavage was 42% (48/115), 33% (40/120), and 35% (52/150), respectively, and blastocyst development was 53% (21/40), 50% (11/22), and 55% (23/42), respectively (P > 0.05). On Day 2, 45 embryos produced by IVF of in vivo matured oocytes with X-chromosome bearing sperm were transferred to the oviduct of four Day 1 recipients, three of which subsequently delivered litters of one, four, and seven female kittens, respectively. In conclusion, we confirmed that sperm sorting technology can be applied to domestic cats and established that kittens of predetermined sex can be produced.
Keywords: Sperm; Cat; Sex-sorting; In vitro fertilization; Embryo transfer

G. Laible, Enhancing livestock through genetic engineering--Recent advances and future prospects, Comparative Immunology, Microbiology and Infectious Diseases, Volume 32, Issue 2, Genetically modified animals, March 2009, Pages 123-137, ISSN 0147-9571, DOI: 10.1016/j.cimid.2007.11.012.
(http://www.sciencedirect.com/science/article/B6T5H-4RW4S19-8/2/8949339119aaa6a2b89d9280c78afe2a)
Abstract:
Transgenic technology allows for the stable introduction of exogenous genetic information into livestock genomes. With its ability to enhance existing or introduce entirely novel characteristics at unprecedented magnitude and speed this emerging technology is expected to have a profound impact on the genetic improvement of livestock in the future. The continual advances in animal genomics towards the identification of genes that influence livestock production traits and impact on human health will increase its ability and versatility for the purposeful modification of livestock animals to enhance their welfare, produce superior quality food and biomedical products and reduce the environmental impact of farming. In contrast to biomedicine, which has so far been the main driver for this technology platform, the potential opportunities for animal agriculture are more challenging because of the greater demands on cost, efficiency, consumer acceptance and relative value of the product. While various transgenic concepts for the genetic improvement of

livestock animals for agriculture are being evaluated the integration of this technology into practical farming systems remains some distance in the future.
Keywords: Livestock; Agriculture; Transgenesis; Genetic modification; Disease resistance; Food; Animaux d'elevage; Agriculture; Transgenese; Modification genetique; Resistance aux maladies; Alimentation

Reiner Jedermann, Luis Ruiz-Garcia, Walter Lang, Spatial temperature profiling by semi-passive RFID loggers for perishable food transportation, Computers and Electronics in Agriculture, Volume 65, Issue 2, March 2009, Pages 145-154, ISSN 0168-1699, DOI: 10.1016/j.compag.2008.08.006.
(http://www.sciencedirect.com/science/article/B6T5M-4TM9N9D-1/2/4afec59a28c177512d14993e0332bbcb)
Abstract:
Perishable food products are at risk of suffering various damages along the cold chain. The parties involved should control and monitor the conditions of goods in order to ensure their quality for consumers and to comply with all legal requirements. Among environmental parameters during transport, temperature is the most important in prolonging the shelf life of the products. Radio Frequency IDentification (RFID) is an emergent technology that has proven its suitability for tracking and tracing in logistics. This paper shows how miniaturized RFID temperature loggers can be adapted to analyze the amount of local deviations, detect temperature gradients, and estimate the minimum number of sensors that are necessary for reliable monitoring inside a truck or container. These devices are useful tools for improving the control during the transport chain and detecting weaknesses by identifying specific problem areas where corrective actions are necessitated. In a first step, the RFID tags were tested by studying the temperature distribution in a pallet. Then, 15 shipments from a wholesale company in Germany in compartmented trucks were monitored, covering different temperature range conditions. During transport, several temperature differences were found in the same compartment. Using a factorial Analysis of Variance (ANOVA) the influence of different factors has been studied, such as: the location of the logger, type of truck, and external temperature. The shelf life, or keeping quality model, was applied to the recorded temperature profiles. Suggestions for future research areas are also discussed.
Keywords: Semi-passive RFID; Temperature monitoring; Food transportation

Ravit Hait-Darshan, Shlomo Grossman, Margalit Bergman, Mordehai Deutsch, Naomi Zurgil, Synergistic activity between a spinach-derived natural antioxidant (NAO) and commercial antioxidants in a variety of oxidation systems, Food Research International, Volume 42, Issue 2, March 2009, Pages 246-253, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.11.006.
(http://www.sciencedirect.com/science/article/B6T6V-4V17CM8-1/2/f1828c02fd8fac0b980be2d288c8a618)
Abstract:
Recently, there has been great interest in the potential health benefits of foods containing polyphenols, especially from plants, due to their antioxidant content. Natural antioxidant (NAO) is a unique, powerful antioxidant which was isolated in our lab from spinach leaves. The main goal of this study was to examine potential synergistic activity in combinations of NAO and commercial antioxidants. The antioxidant activity was tested in several in vitro systems including fatty acid and fat oxidation and also in cancer cell lines. We used the unique optical live cell array (LCA) technology to monitor the generation of reactive oxygen species (ROS) in single cells over time. NAO was combined with selected commercial antioxidants, and synergistic activity that reduced ROS generation was found with three polyphenols - ferulic acid, caffeic acid, and epigallocatechin-3-gallate (EGCG). These findings demonstrate the importance of using antioxidant `cocktails' which may enhance medical effects in many kinds of diseases, including cardiovascular diseases and cancer.

Keywords: Antioxidant; NAO; Ferulic acid; Caffeic acid; EGCG; ROS

T. Norton, A. Delgado, E. Hogan, P. Grace, Da-Wen Sun, Simulation of high pressure freezing processes by enthalpy method, Journal of Food Engineering, Volume 91, Issue 2, March 2009, Pages 260-268, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.08.031.
(http://www.sciencedirect.com/science/article/B6T8J-4TF2HY8-2/2/ddb4702ba946db80f88294576ddf9712)
Abstract:
High pressure freezing processes such as pressure assisted freezing (PAF) and high pressure shift freezing (HPSF) are novel technologies that can be used to improve the quality of frozen foods. A one dimensional finite difference numerical model based on the enthalpy formulation was developed to simulate high pressure freezing of tylose, agar gel and potatoes. The Schwartzberg equation was used in the prediction of both the initial freezing point and the temperature evolution below freezing. Results showed that the model can satisfactorily describe the PAF and HPSF processes. When compared under similar heat transfer conditions, the phase transition times for HPSF were shorter than those at atmospheric pressure. The amount of ice instantaneously formed upon pressure release and the total freezing times were also determined by the developed model and were in reasonable agreement with the experimental data in the literature.
Keywords: Enthalpy method; Freezing; Frozen foods; High pressure; HPSF; Ice crystallisation; Modelling; PAF; Simulation

Shridhar K. Sathe, LWT - Food Science and Technology Editorial, LWT - Food Science and Technology, Volume 42, Issue 2, March 2009, Page 447, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.09.004.
(http://www.sciencedirect.com/science/article/B6WMV-4TGS7P6-1/2/3c211f814c359a05f830ba0a9dc10d7a)

Eva Almenar, Ramon Catala, Pilar Hernandez-Munoz, Rafael Gavara, Optimization of an active package for wild strawberries based on the release of 2-nonanone, LWT - Food Science and Technology, Volume 42, Issue 2, March 2009, Pages 587-593, ISSN 0023-6438, DOI: 10.1016/j.lwt.2008.09.009.
(http://www.sciencedirect.com/science/article/B6WMV-4TJ1HTY-2/2/17f862032b12f56f36e073a89cf5083e)
Abstract:
Active packaging is becoming in an emerging food technology to improve quality and safety of food products, commonly based on the retention or release of compounds which are beneficial for the product. In this work, an active packaging system based on the release of 2-nonanone has been optimized to increase the postharvest shelf life of fresh wild strawberries during the marketing stage. To avoid that excessive levels of this volatile could affect the berries' taste and cause consumer rejection of the product, a preliminary sensory analysis was carried out to determine the threshold value of 2-nonanone, 7.16 mg/kg fresh wild strawberries. Taking this threshold value into account, diverse quantities of 2-nonanone were tested to optimize the packaging parameters. Wild strawberry fruits were packaged in the active packages developed and their quality monitored during storage at 10 [degree sign]C with exposure to light to simulate real-life conditions on supermarket shelves. The analyses of weight loss, SSC, gas composition and aroma volatiles provide evidences that exposure to the highest-tested 2-nonanone concentrations are an effective way of maintaining the quality of wild strawberries during distribution and sale without modifying their typical taste.
Keywords: Active packaging; 2-Nonanone; Fruit quality; Wild strawberry fruit

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

Elene P. Nardi, Fabio S. Evangelista, Luciano Tormen, Tatiana D. Saint'Pierre, Adilson J. Curtius, Samuel S. de Souza, Fernando Barbosa Jr, The use of inductively coupled plasma mass spectrometry (ICP-MS) for the determination of toxic and essential elements in different types of food samples, Food Chemistry, Volume 112, Issue 3, 1 February 2009, Pages 727-732, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.06.010.
(http://www.sciencedirect.com/science/article/B6T6R-4SRW17R-7/2/ca897d3a251fdb18ecbe27f402b426a5)
Abstract:
This paper describes a simple method for the determination of sixteen elements in food samples by using inductively coupled plasma spectrometry (ICP-MS). Prior to analysis, 100-250 mg of powdered food samples were accurately weighed into a Teflon digestion vessel. Then, 4 ml of 20% v/v concentrated nitric acid and 2 ml of hydrogen peroxide were added. Decomposition of samples was carried out in a microwave digestion system. In order to verify the accuracy and precision of the proposed method, five Standard Reference Materials from the National Institute of Standards and Technology (NIST) (Whole Egg Powder RM 8415, Rice Flour SRM 1568a, Typical Diet SRM 1548a, Wheat Flour SRM 1567a and Bovine Muscle Powder RM 8414) were analyzed.

Additional validation data are provided based on the analysis of 18 different types of food samples by the proposed method and using comparative methods with AAS as the detector.
Keywords: ICP-MS; Food samples; Trace elements; Rapid determination

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

M. Bononi, F. Tateo, Determination of furan by headspace solid-phase microextraction-gas chromatography-mass spectrometry in balsamic vinegars of Modena (Italy), Journal of Food Composition and Analysis, Volume 22, Issue 1, February 2009, Pages 79-82, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.07.011.
(http://www.sciencedirect.com/science/article/B6WJH-4TJ1HJJ-6/2/f33c1ee9c8844645b7bb885098b5f4c5)
Abstract:
An isotope dilution method for quantification of furan by internal standardization was adopted, using head space solid phase microextraction (HS-SPME) technique, to evaluate various samples of 'aceto balsamico di Modena' (ABM), in order to verify if this seasoning may contribute to the intake of furans in the human diet. Matrix-matched calibration curves were adopted, and furan levels in the majority of the samples purchased on the Italian market ranged between 4 and 26 ng/g. Considering that furan levels in ABM derive from the heat-concentrated must of grapes and from the additive caramel E 150d often used in the production technology, the level of furan in the concentrated must appears, in some samples, not to be the only important factor affecting the risk assessment of furan linked to the use of ABM.
Keywords: Furan; Balsamic vinegar; Aceto balsamico di Modena; Italian wine vinegars; Solid-phase microextraction; Gas chromatography-mass spectrometry; Seasoning; Caramel; Food composition; Food safety

Gopinadhan Paliyath, Berry Fruit: Value-Added Products for Health Promotion, edited by Yanyun Zhao, Published by CRC Press, Boca Raton, Florida, 2007. ISBN-13:978-0-8493-5802-9; 10: 0-

8493-5802-7; Food Science and Technology Series, Volume 168. Price-$179.95., Trends in Food Science & Technology, Volume 20, Issue 2, February 2009, Pages 104-105, ISSN 0924-2244, DOI: 10.1016/j.tifs.2009.01.006.
(http://www.sciencedirect.com/science/article/B6VHY-4VBDK8C-6/2/b667cca271c0185ed6dd38dcfebc1cf0)

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)

Loong-Tak Lim, Food Packaging Science and Technology, Dong Sun Lee, Kit L. Yam, Luciano Piergiovanni, Published by CRC Press/Taylor & Francis Groups, Boca Raton, FL, 2008, Price: $89.95., Trends in Food Science & Technology, Volume 20, Issue 2, February 2009, Pages 106-107, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.11.002.
(http://www.sciencedirect.com/science/article/B6VHY-4V0MMX1-1/2/3a8b168710b05903333df7be5a27d3b9)

Yasmine Probst, Holley Jones, Shannon Lin, Sandy Burden, David Steel, Linda Tapsell, Updating the DietAdvice website with new Australian food composition data, Journal of Food Composition and Analysis, In Press, Corrected Proof, Available online 22 January 2009, ISSN 0889-1575, DOI: 10.1016/j.jfca.2008.11.014.
(http://www.sciencedirect.com/science/article/B6WJH-4VF56TB-2/2/de987be37d720d4b27d10af74ac3649f)
Abstract:
DietAdvice is an Australian self-administered dietary assessment website initially developed in 2003-2005. The website allows patients to enter their dietary information and dieticians to remotely access and interpret the data. DietAdvice is presently being updated with new Australian food composition data. This study aims to describe the update process for moving from 1995 to 2006 food composition data. The database for the website was developed using grouped food data from the NUTTAB 1995 database. All food groups were cross-matched with the food from the NUTTAB 2006 database using the food ID codes. Rules were applied to determine the suitability of the food for inclusion in the database. New, ungrouped foods were considered individually and added to existing groups or grouped together as new groups. Foods within each group were statistically weighted to determine the nutrient profile for each group. The NUTTAB 1995 data was used to develop 19, 103 and 422 first, second and third level groups, respectively. From the NUTTAB 2006 data, an additional 623 foods needed to be individually considered. The final database contained 23, 123 and 430 first, second and third level groups, respectively. Ensuring the most recent food composition data is incorporated into the database of the website will maximise the accuracy of the dietary advice provided by the dieticians.
Keywords: Diet history; Food groups; Technologies; Professional judgement; Website; Food composition database; DietAdvice; Dietary assessment; Food data management; Australia; Food composition

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

A. Milstein, M.A. Wahab, A. Kadir, M.F.H. Sagor, M.A. Islam, Effects of intervention in the water column and/or pond bottom through species composition on polycultures of large carps and small indigenous species, Aquaculture, Volume 286, Issues 3-4, 17 January 2009, Pages 246-253, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2008.09.036.
(http://www.sciencedirect.com/science/article/B6T4D-4TN82DT-1/2/b943ed0b30dff0635eca0dc0b701cac9)
Abstract:
In Bangladesh, a sustainable semi-intensive pond aquaculture technology including large carp species as cash-crop and small indigenous fish species (SIS) as food for the farmers' families is being optimized. The present paper is on the effects on fish performance and pond ecology of interfering in the water column and/or on the bottom through changes in the polyculture composition. The Control polyculture was the `no-effect' combination consisting of the traditional 33 rohu-33 catla-34 common carp stocking with the addition of 250 SIS and 3 silver carp per 100 m2 of pond, as resulted from a previous experiment. Interferences on the water column were achieved by changing the density of the herbivorous fish (reducing the density of catla to 24/100 m2 and increasing that of silver carp to 12/100 m2), and on the bottom by doing so on the benthophagous fish (replacing 10/100 m2 common carp by the same amount of mrigal). Mola was the SIS included in the polyculture.
Interfering in the water column and/or in the pond bottom through the polyculture composition produced complex responses in the pond ecosystem affecting the large carps' performances, while it did not significantly affect the reproduction and the harvested biomass of the small fish mola. Relationships among the different fish species and the environment are described for each polyculture. The four polycultures tested allowed a good production of large carp species as cash-crop, of silver carp as an option to consume or to sell, and of the small species mola as food for the farmers' families. The Control polyculture is appropriate to produce relatively large herbivorous species, mainly silver carp. The polyculture combination in the Water treatment is appropriate to obtain a larger amount of smaller silver carp that can be afforded by the poor people but also smaller rohu and catla, while maintaining the same level of total yield and income with reduced feed conversion ratio (FCR) than in the Control treatment. The polyculture combination in the Bottom treatment allowed a larger fish species diversity and also produced smaller herbivorous fish with still reduced FCR, while maintaining the same level of total yield and income than the Control treatment. The polyculture combination in the Water&Bottom treatment gave the best results: it allowed a larger fish species diversity, is appropriate to obtain a larger amount of small silver carp that can be afforded by the poor people, and gives the highest total yield and income with the lowest FCR.
Keywords: Fish interactions; Natural food web; Polyculture; SIS small indigenous species

Patrick Austin Darrow, John Anthony Shivik, Bold, shy, and persistent: Variable coyote response to light and sound stimuli, Applied Animal Behaviour Science, Volume 116, Issue 1, 15 January 2009, Pages 82-87, ISSN 0168-1591, DOI: 10.1016/j.applanim.2008.06.013.
(http://www.sciencedirect.com/science/article/B6T48-4T9BXDD-1/2/9a3708aa4ebf0dff840258aa19deed72)
Abstract:
To improve frightening device technology for managing predation, we examined variation in coyote (Canis latrans) response to visual, auditory, and combined stimuli using a behavior-contingent programmable frightening device. We hoped to gather information on the relative effectiveness of light, sound, and combined stimuli for deterring coyotes from a food resource. We exposed five pairs of captive coyotes each to one of three stimuli during a 10-day treatment period. Coyotes habituated to the three stimuli differentially ([chi]2 = 7.8, d.f. = 2, P = 0.02). Four of five coyote pairs habituated to sound treatment, one of five pairs habituated to light stimulus, and none of five pairs habituated to combined stimuli. We further examined variability in coyote response to the device and determined that social status predicted boldness; 67% (S.E. = 12%) and 33% (S.E. = 12%) of subordinate and dominant coyotes attempted to eat the protected food respectively. Similarly, 60% (S.E. = 15%) and 20% (S.E. = 18%) of subordinate and dominant coyotes habituated and ate respectively. Our findings suggest that light may be the most important component of a frightening device for coyotes, but because coyotes can be bold or persistent, significant numbers of coyotes are expected to overcome a frightening device's long-term effectiveness.
Keywords: Behavior-contingent; Canis latrans; Deterrent; Frightening device; Habituation; Repellent; Wildlife damage management

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

Paula Santiago-Silva, Nilda F.F. Soares, Juliana E. Nobrega, Marcus A.W. Junior, Kiriaque B.F. Barbosa, Ana Carolina P. Volp, Evelyn R.M.A. Zerdas, Nedio J. Wurlitzer, Antimicrobial efficiency of film incorporated with pediocin (ALTA(R) 2351) on preservation of sliced ham, Food Control, Volume 20, Issue 1, January 2009, Pages 85-89, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2008.02.006.
(http://www.sciencedirect.com/science/article/B6T6S-4RY8SK8-1/2/fd0456896263f8a9e306fb9496cf2a52)

Abstract:
Antimicrobial packaging, besides protecting the product from external environment, inhibits or retards microorganism growth in foods, minimizing direct addition of preservatives and satisfying the actual demand of consumers for healthier foods, containing less additives. Pediocins are antimicrobial peptides produced by Pediococcus sp. and researches have revealed their ability to inhibit the growth of some pathogenic bacteria. The objective of this work was to develop and evaluate the antimicrobial efficiency of films incorporated with pediocin on sliced ham conservation. The antimicrobial films were incorporated with pediocin (25% and 50%) in a cellulose base emulsion. The antimicrobial efficiency of the films against Listeria innocua e Salmonella sp. on sliced ham was tested by means of a challenge test, in which the slices were immersed in 0.1% peptone solution containing about 106 CFU/mL of L. innocua or Salmonella sp. The experiment was set up overlapping the slices of ham with the films (control, 25% and 50% of pediocin). These systems were packaged under vacuum and stored at 12 [degree sign]C. The slices of ham were analyzed for L. innocua and Salmonella sp. counts at 0, 3, 6, 9, 12 and 15 storage days. The antimicrobial films were more effective inhibiting growth of L. innocua. The 50% pediocin-film presented a reduction of 2 log cycles in relation to control treatment after 15 days of storage. The 25% and 50% pediocin-films had similar performance on Salmonella sp. inhibition, both presenting 0.5 log cycle reduction in relation to control, after 12 days of storage. Hence, the films incorporated with pediocin showed potential use as one hurdle technology added in the storage period among others good manufacturing practices for preservation of sliced ham.
Keywords: Active packaging; Pediocin; Listeria innocua; Sliced ham

Yanbo Wang, Prebiotics: Present and future in food science and technology, Food Research International, Volume 42, Issue 1, January 2009, Pages 8-12, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.09.001.
(http://www.sciencedirect.com/science/article/B6T6V-4TF7C7G-1/2/5e67f6273b49a9d96783bb44d06f864c)
Abstract:
Because of its resident microbiota, the human colon is one of the body's most metabolically active organs. The use of diet to fortify certain gut flora components is a popular current aspect of functional food sciences and prebiotics have a significant role. Prebiotics are selectively fermented ingredients that allow specific changes, both in the composition and/or activity in the gastrointestinal microbiota that confers benefits upon host well-being and health. Improved techniques for analysis of the gut microflora, new food manufacturing biotechnologies, and increased understanding of the metabolism of prebiotic inulin and oligosaccharides by probiotics are facilitating development. Such developments are leading us to the time when we will be able to rationally develop prebiotics for specific functional properties and health outcomes. Thus, this review will focus on the progress of prebiotics in food science and technology in understanding the important role of prebiotics in health, beginning at the rationale of gut microflora and interactions with prebiotics. Furthermore, the classification criteria, food applications and safety assessment of prebiotics as food ingredient is also discussed.
Keywords: Prebiotics; Food; Gut microflora; Probiotics; Review

Yong-guang Yin, Yun Ding, A close to real-time prediction method of total coliform bacteria in foods based on image identification technology and artificial neural network, Food Research International, Volume 42, Issue 1, January 2009, Pages 191-199, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.10.006.
(http://www.sciencedirect.com/science/article/B6T6V-4TTHW9G-1/2/88a13111e81356b6557e554a314fad8e)
Abstract:

A prediction method of total coliform bacteria based on image identification technology in foods was proposed. In order to get the close to real-time detection results, this method used the total count of bacteria and bacilli to predict the total coliform bacteria counts because coliforms are difficult to extract the feature parameters to be recognized and enumerated, while total count of bacteria and bacilli could be enumerated by using image identification technology. An optimal artificial neural network (ANN) model was presented for prediction of total coliform bacteria counts. Several configurations were evaluated while developing the optimal ANN model. The optimal ANN model consisted two hidden layers with five neurons in each hidden layer. Results showed that predicted total coliform bacteria counts were positively correlated to the experimental total coliform bacteria counts obtained by traditional multiple-tube fermentation technique (correlation coefficient, R2 = 0.9716), which predicted accuracy was much better than other predicted models (the correlation coefficient of linear regression model, second-order polynomial regression model and polynomial trend surface analysis was 39.81%, 67.17% and 78.85%, respectively).
Keywords: Total coliform bacteria; Micro-image identification technology; Artificial neural network

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

Xiang Xu, Liping Sun, Jie Dong, Hongcheng Zhang, Breaking the cells of rape bee pollen and consecutive extraction of functional oil with supercritical carbon dioxide, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 42-46, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.08.004.
(http://www.sciencedirect.com/science/article/B6W6D-4T9VP7V-2/2/4ed0d8e3c768671af1adbcff231b14f4)
Abstract:
Supercritical carbon dioxide was applied to break the cell wall of rape bee pollen and consecutively extract lyzed bee pollen oil. The supercritical CO2 rapid depressurization was carried out on the bee pollen. The conditions of consecutive extraction of lyzed bee pollen oil were optimized using response surface methodology and performed at the range of pressure 13.2-46.8 MPa, temperature 33.2-66.8 [degree sign]C and CO2 flow rate 6.6-23.4 L/h. Scanning electron microscopy studies revealed that supercritical CO2 treatment was an effective way to break cell of rape bee pollen and higher CO2 pressure was found to be more effective. The extraction pressure, temperature and CO2 flow rate significantly affected the yield of lyzed bee pollen oil in supercritical CO2 extraction. Optimum oil yield was obtained as 5.98 g/100 g dry pollen at the following predicted conditions: extracted at 39.2 MPa and 54.7 [degree sign]C with CO2 flow rate of 17.1 L/h after bee pollen was treated with supercritical CO2 at 45 MPa for 10 min and then depressurizing. Polyunsaturated fatty acids were the predominant fatty acids in the extracted oil, indicating its potential in the nutraceutical industry.Industrial relevance
The application of supercritical CO2 technology in food industry has received much attention in recent years. This study investigates the feasibility of breaking pollen cell wall by supercritical CO2. The procedure is under low temperature with short time. From an industrial point of view, it is a promising method for breaking bee pollen cell wall. The optimum parameter of supercritical CO2 extraction of functional pollen oil simultaneously obtained from the process may also be attractive to the food and nutraceutical industries.
Keywords: Supercritical CO2; Cell wall breakage; Lyzed bee pollen oil; Polyunsaturated fatty acids

Xiaojun Liao, Yan Zhang, Jun Bei, Xiaosong Hu, Jihong Wu, Alterations of molecular properties of lipoxygenase induced by dense phase carbon dioxide, Innovative Food Science & Emerging Technologies, Volume 10, Issue 1, January 2009, Pages 47-53, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.06.007.
(http://www.sciencedirect.com/science/article/B6W6D-4SWWT5R-3/2/33938ab6c3e2d22446bee71958b170e0)
Abstract:
Alterations of molecular properties of lipoxygenase (LOX) induced by dense phase carbon dioxide (DPCD) were analyzed using transmission electronic microscope (TEM), SDS-PAGE and native-PAGE, far UV-circular dichroism (CD) and fluorescence spectroscopy. The aggregation of LOX molecules was suggested by an increase in the particle size of LOX after DPCD treatment. The absence of LOX band was observed after exposure to DPCD at 55 [degree sign]C for 30 min on the native-PAGE due to the aggregation, but the electrophoretic behavior of LOX was not altered on the SDS-PAGE. The CD and fluorescence spectra of DPCD-treated LOX were noticeably changed, its [alpha]-helix relative content decreased sharply to less than 10%, and its intrinsic

relative fluorescence intensity (RFI) decreased linearly with increasing pressures.Industrial relevance
As a novel non-thermal technology, DPCD can retain the quality of foods to be processed. However, the inactivation mechanism of food enzymes by DPCD is not elucidated until today. This investigation is beneficial to understand the mechanism and to push the application of this technology in food industry.
Keywords: Dense phase carbon dioxide; Lipoxygenase; Transmission electronic microscope; SDS-PAGE; Native-PAGE; Circular dichroism; Fluorescence spectroscopy

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

Daniela F. Olivera, Viviana O. Salvadori, Effect of freezing rate in textural and rheological characteristics of frozen cooked organic pasta, Journal of Food Engineering, Volume 90, Issue 2, January 2009, Pages 271-276, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2008.06.041.
(http://www.sciencedirect.com/science/article/B6T8J-4SYCPKD-2/2/32141bdac88895e26251eb2f4c221f7e)
Abstract:
The ready-meals market has grown significantly in developed countries over the past decade. In particular, organic pasta entirely formulated with organic ingredients and marketed as ready-to-eat meals, is an excellent choice of processed organic food.
Of the available preservation technologies, freezing has been recognized as an excellent method of preserving the quality characteristics of foods. The aim of this work was to study the influence of two freezing conditions (air blast and cryogenic) on the quality of cooked organic pasta, in particular organic tagliatelle. Textural characteristics (textural profile analysis) and rheological measurements (relaxation and dynamic oscillatory tests) were performed in fresh cooked and frozen cooked pasta. The experimental results confirm that freezing produces structural damage in both frozen cooked organic pasta, the elasticity, the firmness and the water holding capacity being the more affected parameters. Textural analysis demonstrated that freezing rate was directly

correlated to their derived parameters. A sensory analysis confirmed that instrumental results are detected by consumers.
Keywords: Freezing; Organic pasta; Rheology; Texture

Colin J. Barrow, Coleen Nolan, Bruce J. Holub, Bioequivalence of encapsulated and microencapsulated fish-oil supplementation, Journal of Functional Foods, Volume 1, Issue 1, January 2009, Pages 38-43, ISSN 1756-4646, DOI: 10.1016/j.jff.2008.09.006.
(http://www.sciencedirect.com/science/article/B9848-4TN5MRW-7/2/b8a4bc721c633e6657d3c38eeb2c33e3)
Abstract:
Omega-3 oil from fish can be stabilised against oxidation using a variety of microencapsulation technologies. Complex coacervation has been used and found to be commercially useful for fortifying foods and beverages with long-chain omega-3 containing oils. Here we report a comparative human bioavailability study of microencapsulated omega-3 fish oil and standard fish-oil soft-gel capsules. Phospholipid levels of long-chain omega-3 fatty acids increased equivalently in both subjects groups. Also, triacylglycerol levels were reduced similarly in both groups. These results indicate that omega-3 fatty acids have equivalent bioavailability when delivered as microencapsulated complex coacervates or as soft-gel capsules.
Keywords: Bioequivalence; Bioavailability; Microencapsulation; Omega-3; EPA; DHA; Supplement; Coacervation

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

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.

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.

Hudaa Neetoo, Mu Ye, Haiqiang Chen, Potential application of high hydrostatic pressure to eliminate Escherichia coli O157:H7 on alfalfa sprouted seeds, International Journal of Food Microbiology, Volume 128, Issue 2, 10 December 2008, Pages 348-353, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.09.011.
(http://www.sciencedirect.com/science/article/B6T7K-4TJTX38-2/2/0006a90d198d940332bbb1cd3e5228cb)
Abstract:
Sprouts eaten raw are increasingly being perceived as hazardous foods as they have been implicated in Escherichia coli O157:H7 outbreaks where the seeds were found to be the likely source of contamination. The objective of our study was to evaluate the potential of using high hydrostatic pressure (HHP) technology for alfalfa seed decontamination. Alfalfa seeds inoculated with a cocktail of five strains of E. coli O157:H7 were subjected to pressures of 500 and 600 MPa for 2 min at 20 [degree sign]C in a dry or wet (immersed in water) state. Immersing seeds in water during pressurization considerably enhanced inactivation of E. coli O157:H7 achieving reductions of 3.5 log and 5.7 log at 500 and 600 MPa, respectively. When dry seeds were pressurized, both pressure levels reduced the counts by < 0.7 log. To test the efficacy of HHP to completely decontaminate seeds whilst meeting the FDA requirement of 5 log reductions, seeds inoculated with a ~ 5 log CFU/g of E. coli O157:H7 were pressure-treated at 600 and 650 MPa at 20 [degree sign]C for holding times of 2 to 20 min. A > 5 log reduction in the population was achieved when 600 MPa was applied for durations of >= 6 min although survivors were still detected by

enrichment. When the pressure was stepped up to 650 MPa, the threshold time required to achieve complete elimination was 15 min. Un-inoculated seeds pressure-treated at 650 MPa for 15 min at 20 [degree sign]C successfully sprouted achieving a germination rate identical to untreated seeds after eight days of sprouting. These results therefore demonstrate the promising application of HHP on alfalfa seeds to eliminate the risk of E. coli O157:H7 infections associated with consumption of raw alfalfa sprouts.
Keywords: Alfalfa; Mung bean; Seeds; Sprouts; Escherichia coli O157:H7; High hydrostatic pressure

Frederik Neuwahl, Andreas Loschel, Ignazio Mongelli, Luis Delgado, Employment impacts of EU biofuels policy: Combining bottom-up technology information and sectoral market simulations in an input-output framework, Ecological Economics, Volume 68, Issues 1-2, 1 December 2008, Pages 447-460, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2008.04.018.
(http://www.sciencedirect.com/science/article/B6VDY-4SP64YD-1/2/f574e386028839ec61f477db1f2a98be)
Abstract:
This paper analyses the employment consequences of policies aimed to support biofuels in the European Union. The promotion of biofuel use has been advocated as a means to promote the sustainable use of natural resources and to reduce greenhouse gas emissions originating from transport activities on the one hand, and to reduce dependence on imported oil and thereby increase security of the European energy supply on the other hand. The employment impacts of increasing biofuels shares are calculated by taking into account a set of elements comprising the demand for capital goods required to produce biofuels, the additional demand for agricultural feedstock, higher fuel prices or reduced household budget in the case of price subsidisation, price effects ensuing from a hypothetical world oil price reduction linked to substitution in the EU market, and price impacts on agro-food commodities. The calculations refer to scenarios for the year 2020 targets as set out by the recent Renewable Energy Roadmap. Employment effects are assessed in an input-output framework taking into account bottom-up technology information to specify biofuels activities and linked to partial equilibrium models for the agricultural and energy sectors. The simulations suggest that biofuels targets on the order of 10-15% could be achieved without adverse net employment effects.
Keywords: Biofuels; Input-output; Employment

Augustine S. Langyintuo, Catherine Mungoma, The effect of household wealth on the adoption of improved maize varieties in Zambia, Food Policy, Volume 33, Issue 6, Food Product Composition, Consumer Health, and Public Policy, December 2008, Pages 550-559, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2008.04.002.
(http://www.sciencedirect.com/science/article/B6VCB-4SM1WWB-1/2/096b0cda439a323b7ffedcd75210b9ff)
Abstract:
Production and price risks that could render input use unprofitable sometimes prevent rural households from benefiting from input technological change. The household's ability to cope with such risks and hence benefit from input technological change is often positively related to its wealth or stock of productive assets. Empirical evidence, however, suggests a non-linear relationship between wealth and adoption of new agricultural technologies so that within a rural community, households on the lower wealth continuum behave differently from those on the higher level. Using farm level data collected from 300 randomly selected households in three districts of Zambia in 2004/2005 crop season, this paper first stratifies households into poorly- and well-endowed households based on their access to productive assets and estimates separate double-hurdle models for the adoption of improved, high yielding maize (IHYM) varieties for each group. The results show that factors influencing the adoption and use intensity of IHYM varieties differ

between the two groups. This draws attention to the need for recommending wealth group-specific interventions to increase the adoption and use intensity of such varieties and their subsequent impacts on food security and general livelihoods of the households. The explicit testing for the possibility that differences in household wealth affect the way in which other variables influence adoption decisions is the paper's unique contribution to the adoption literature.
Keywords: Wealth index; Improved high yielding maize variety; Technological change; Double-hurdle model; Zambia

D.N. Cox, G. Evans, Construction and validation of a psychometric scale to measure consumers' fears of novel food technologies: The food technology neophobia scale, Food Quality and Preference, Volume 19, Issue 8, Seventh Rose Marie Pangborn Sensory Science Symposium, December 2008, Pages 704-710, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2008.04.005.
(http://www.sciencedirect.com/science/article/B6T6T-4SC78PD-1/2/b1473aff251e55b501021e8350913f15)
Abstract:
Consumers' fears of novel food technologies are documented. The ability to identify population segments that have greater or lesser neophobia, thus enabling identification of early adopters of innovative products, would be useful. The Food Neophobia Scale [FNS; Pliner, P., & Hobden, K. (1992). Development of a scale to measure the trait of food neophobia in humans. Appetite, 19, 105-120] is a useful tool for assessing reactions to ethnic foods (and sensation seeking) but less suitable for assessing receptivity to foods produced by novel technologies. Therefore, there is a need to develop a new psychometric tool that identifies food technology neophobia.
In a three stage validation exercise, 81 statements (items) were reduced to 31 (n = 193) and subsequently reduced to 13 items (n = 459) by factor analysis. After a face validity check, the new 13 item Food Technology Neophobia Scale was tested (n = 295) and found to have predictive (criterion) validity (willingness to consume foods produced by novel food technologies). Furthermore, convergent validity was found between the FTNS and Trust in Science scale [TISS; Bak, H. (2001). Education and public attitudes toward science: Implications for the `deficit model' of education and support for science and technology. Social Science Quarterly, 82(4), 779-793] and FNS.
Keywords: Neophobia; Novel technologies; Validation; Convergence; Criterion; Predictive; Food

Mikel. C. Duke, Agnes Lim, Sheila Castro da Luz, Lars Nielsen, Lactic acid enrichment with inorganic nanofiltration and molecular sieving membranes by pervaporation, Food and Bioproducts Processing, Volume 86, Issue 4, December 2008, Pages 290-295, ISSN 0960-3085, DOI: 10.1016/j.fbp.2008.01.005.
(http://www.sciencedirect.com/science/article/B8JGD-4S2VRM2-1/2/3a69d394f9babbb452b832b514fae8ce)
Abstract:
Lactic acid is a valuable product in the food industry, but requires expensive complex systems to purify. Porous inorganic membranes have high fluxes and water separation potential and are driven only by pressure difference without the need for added chemicals. Here we show the application of readily available [gamma]-alumina (nanofiltration), and the more advanced molecular sieve silica membranes, to enrich lactic acid for product use by selectively depleting water through the membrane. The alumina membranes showed flux starting at 6 kg m-2 h-1, reducing to 1 kg m-2 h-1 after 250 min due to pore blocking of lactic acid. The membrane acted to remove water from the 15 wt% feed, with permeate lactic acid concentration at 2 wt% corresponding to a water selectivity factor of 9. Silica membranes on the other hand exhibited a water selectivity factor up to 220 (a rejection coefficient of 0.995) with lactic acid in the permeate as low as 0.08 wt% after regeneration with an overall stable flux of 0.2 kg m-2 h-1. The strong surface charge and wider pore size of the alumina membrane enabled a slow pore blocking

mechanism, with flux dropping towards that of the silica membrane. The silica membrane was therefore the choice technology as the tight pore spaces inhibited lactic acid from entering and the charge-neutral surface leading to a more stable separation not subject to pore blocking. Performance results allowed calculation of membrane area for industrial separation. Flux improvements and longer term studies are needed to improve silica membrane commercial attraction.
Keywords: Lactic acid; Separation; Inorganic membrane; Pervaporation; Nanofiltration; Molecular sieve

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

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

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

Nurit Argov, Danielle G. Lemay, J. Bruce German, Milk fat globule structure and function: nanoscience comes to milk production, Trends in Food Science & Technology, Volume 19, Issue 12, December 2008, Pages 617-623, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.07.006.
(http://www.sciencedirect.com/science/article/B6VHY-4T2M5VN-1/2/ee221d86f859945a223d581ad13313be)
Abstract:
The biological process of fat globule assembly and secretion produces highly complex globule compositions and structures with many properties now recognized to be the direct result of these structures. During homogenization, fat globules are broken down and subsequently structures and surfaces different than the native state are formed. This process alters the milk fat globules' unique macrostructure and the effects associated with their structure would be expected to be lost. In the present overview, the need for continued research of the fundamental aspects of the mechanism involved in milk fat globules synthesis secretion and size distribution, as well as establishing ways to regulate those processes are highlighted. Ultimately these insights will guide food technology to developing a new generation of structure based functional foods and as highlighted in this overview, dairy functional products should be the pioneering commodity.

S.M. Loveday, H. Singh, Recent advances in technologies for vitamin A protection in foods, Trends in Food Science & Technology, Volume 19, Issue 12, December 2008, Pages 657-668, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.08.002.
(http://www.sciencedirect.com/science/article/B6VHY-4T6M827-1/2/11673b9457e13060e30f291db2d5cb54)
Abstract:

Vitamin A deficiency affects many children in the developing world, and is preventable via food or pharmaceutical supplementation. The main technical barrier to the fortification of food with vitamin A is its susceptibility to oxidation and isomerization, which result in loss of nutritional efficacy. This review discusses recent technological avenues for stabilizing vitamin A in foods.

Judith R. Cornelisse-Vermaat, Sylvia Pfaff, Jantine Voordouw, George Chryssochoidis, Gregory Theodoridis, Lois Woestman, Lynn J. Frewer, The information needs and labelling preferences of food allergic consumers: the views of stakeholders regarding information scenarios, Trends in Food Science & Technology, Volume 19, Issue 12, December 2008, Pages 669-676, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.08.003.
(http://www.sciencedirect.com/science/article/B6VHY-4T7XGP2-1/2/7651a0209ae47882de136a09570cfa54)
Abstract:
The information provision to food allergic consumers might be improved if new information and communication technologies were used to optimise traceability of potentially allergenic ingredients. Eight different information scenarios were developed, and their feasibility of application in European food chains discussed with different interested food chain actors in five European countries. The standardised label was chosen as a first preferred scenario, although participants were also positive about the feasibility of introducing novel ICT approaches to traceability and information delivery. Concerns were raised about accountability, upkeep of food allergy data bases, and the additional costs for the services to the food industry.

Tom McMeekin, John Bowman, Olivia McQuestin, Lyndal Mellefont, Tom Ross, Mark Tamplin, The future of predictive microbiology: Strategic research, innovative applications and great expectations, International Journal of Food Microbiology, Volume 128, Issue 1, 5th International Conference on Predictive Modelling in Foods, 30 November 2008, Pages 2-9, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.06.026.
(http://www.sciencedirect.com/science/article/B6T7K-4SWWSYT-1/2/a1863a818846e1926c66e85537e2f824)
Abstract:
This paper considers the future of predictive microbiology by exploring the balance that exists between science, applications and expectations. Attention is drawn to the development of predictive microbiology as a sub-discipline of food microbiology and of technologies that are required for its applications, including a recently developed biological indicator. As we move into the era of systems biology, in which physiological and molecular information will be increasingly available for incorporation into models, predictive microbiologists will be faced with new experimental and data handling challenges. Overcoming these hurdles may be assisted by interacting with microbiologists and mathematicians developing models to describe the microbial role in ecosystems other than food. Coupled with a commitment to maintain strategic research, as well as to develop innovative technologies, the future of predictive microbiology looks set to fulfil 'great expectations'.
Keywords: Predictive microbiology; Model building; Strategic research; Enabling technology; Value analysis; Modelling food and other ecosystems; Microbial persistence and recovery

Luis Asensio, Application of multiplex PCR for the identification of grouper meals in the restaurant industry, Food Control, Volume 19, Issue 11, November 2008, Pages 1096-1099, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2007.11.002.
(http://www.sciencedirect.com/science/article/B6T6S-4R53W72-2/2/f82fc42afe5232badf15464501e42fa3)
Abstract:

Detection of fish species adulteration in the restaurant industry is important for consumer protection and confidence, and for an accurate implementation of the traceability for successful regulatory food controls. In this study, 37 purported grouper (Epinephelus marginatus) meals (20 from school and university lunch rooms and 17 from restaurants) from Madrid have been analysed by using multiplex PCR technology. Species-specific primers of the 5S rDNA gene (designed previously in another work) were used obtaining specific DNA fragments that could authenticate grouper meals; only 9 out of 37 samples were confirmed as authentic grouper. This genetic marker could be very useful for the accurate authentication of grouper meals in the restaurant industry.
Keywords: Grouper; Restaurant industry; Multiplex PCR; Authentication

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

Beata Varga, Regulations for radioisotope content in food- and feedstuffs, Food and Chemical Toxicology, Volume 46, Issue 11, November 2008, Pages 3448-3457, ISSN 0278-6915, DOI: 10.1016/j.fct.2008.08.019.
(http://www.sciencedirect.com/science/article/B6T6P-4T9VPBF-2/2/603d1cdd1b302c936723f8679d861550)
Abstract:
The regulation of contamination levels in food and feed should be made in connection to each other, and described here is a guideline level system with decision rules for radionuclide content in foodstuffs and feedstuffs. Levels for foodstuffs are derived from the general dose limits established by the International Committee of Radiological Protection. For foodstuffs, two levels are suggested: tolerance level for normal situations based on 0.1 mSv/year ingestion dose, and acceptance level for prolonged emergency situations based on 1 mSv/year committed effective dose, with the application of a protection factor of 5 and 3, for children younger than one year and adults, respectively. Current legislation does not contain any derived limits for normal everyday use; however, it is necessary to incorporate limits soon, not only because of the wide use of nuclear technology but also the threat of violent events where foodstuffs are as a vehicle. In addition, technologically enhanced natural isotopes can also cause problems. The derivation of the acceptance level in feedstuffs is based on the suggested acceptance level in foodstuffs, in addition to the latest literature review of transfer coefficients performed in the frame of the Environmental Modelling for Radiation Safety program of the International Atomic Energy Authority.
Keywords: Radioisotope; Tolerance; Acceptance level

Rebecca A. Gould, Deborah Canter, Management Matters, Journal of the American Dietetic Association, Volume 108, Issue 11, November 2008, Pages 1834-1836, ISSN 0002-8223, DOI: 10.1016/j.jada.2008.08.010.
(http://www.sciencedirect.com/science/article/B758G-4TT89NH-B/2/b6460ae23cb8692c86928639a62f60d6)
Abstract:
Fewer than 50% of registered dietitians (RDs) supervise personnel and 76% have no budget authority. Because higher salaries are tied to increasing levels of authority and responsibility, RDs must seek management and leadership roles to enjoy the increased remuneration tied to such positions. Advanced-level practice in any area of dietetics demands powerful communication abilities, proficiency in budgeting and finance, comfort with technology, higher-order decision-making/problem-solving skills, and well-honed human resource management capabilities, all foundational to competent management practice. As RDs envision the future of the dietetics profession, practitioners must evaluate management competence in both hard and soft skills. Just as research is needed to support evidenced-based clinical practice, the same is needed to support management practice across the profession. Dietetics educators and preceptors should be as enthusiastic about management practice as they are clinical practice when educating and mentoring future professionals. Such encouragement and support can mean that new RDs and dietetic technicians, registered, will understand what it takes to advance to higher levels of responsibility, authority, and subsequent enhanced remuneration. In the ever-changing social, legal, ethical, political, economic, technological, and ecological environments of work, food and nutrition professionals who are willing to step forward and assume the risks and responsibilities of management also will share in the rewards, and propel the profession to new heights of recognition and respect.

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

Soumodip Sarkar, Ana I.A. Costa, Dynamics of open innovation in the food industry, Trends in Food Science & Technology, Volume 19, Issue 11, Food Innovation Management, November 2008, Pages 574-580, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.09.006.
(http://www.sciencedirect.com/science/article/B6VHY-4THJGJT-1/2/9c721b443f4d26158634ef0c932dfc44)
Abstract:
A growing number of chain actors, together with difficulties in single-handedly meeting the heterogeneous needs of customers, end-users and legislators, is driving the food industry to open up to external sources of knowledge in search of successful new products and technologies. Empirical evidence of food companies engaging in open innovation remains, however, scarce, as do detailed analyses of related business strategies. We review extant literature on open innovation practices in the food industry and analyze their effects on the sector's innovation capabilities and market outcomes. Finally, we draw implications for food innovation and highlight areas where research is needed.

Michael Siegrist, Factors influencing public acceptance of innovative food technologies and products, Trends in Food Science & Technology, Volume 19, Issue 11, Food Innovation Management, November 2008, Pages 603-608, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.01.017.
(http://www.sciencedirect.com/science/article/B6VHY-4RW4363-1/2/19a23891da89188f6fe630bcd48522e7)
Abstract:
Factors that influence public acceptance of innovative technologies and products in the food area were determined. Results suggest that perceived benefit, perceived risks and perceived naturalness are important factors for the acceptance of new food technologies. Lay people may not only have difficulties in assessing risks associated with novel food technologies, but the benefits of such technologies may also not be obvious. Trust, therefore, is important for the acceptance of new food technologies. Finally, the impact of general psychological constructs, such as food neophobia and others, on the acceptance of new foods is discussed.

Claudia Paoletti, Eric Flamm, William Yan, Sue Meek, Suzy Renckens, Marc Fellous, Harry Kuiper, GMO risk assessment around the world: Some examples, Trends in Food Science & Technology, Volume 19, Supplement 1, EFSA Forum: From Safe Food to Healthy Diets, November 2008, Pages S70-S78, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.07.007.
(http://www.sciencedirect.com/science/article/B6VHY-4T3VR4D-1/2/c6be3a9efada5128d1aa10dd71eb4b5c)
Abstract:
All over the world, authorities responsible for the assessment and surveillance of foods and feeds derived using gene technology and the environmental impacts of genetically modified organisms (GMO) have chosen specific strategies to assess their safety. Although different regulatory frameworks are in place, almost all adopted risk assessment strategies are based on a common set of principles and guidelines. Here we provide some examples of these strategies and we compare them to highlight areas where an international consensus exists. Our hope is that even if limited, this short review can represent a first step towards the recognition of an international consensus and a broader dialog on GMOs regulation worldwide.

Dario Dainelli, Nathalie Gontard, Dimitrios Spyropoulos, Esther Zondervan-van den Beuken, Paul Tobback, Active and intelligent food packaging: legal aspects and safety concerns, Trends in Food Science & Technology, Volume 19, Supplement 1, EFSA Forum: From Safe Food to Healthy Diets, November 2008, Pages S103-S112, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.09.011.

(http://www.sciencedirect.com/science/article/B6VHY-4TVSXWN-B/2/b0d433b921c1f6576a506999c5b6d0bc)
Abstract:
`Active and intelligent' (A&I) food packaging is based on a deliberate interaction of the packaging with the food and/or its direct environment. This article presents: (i) the main types of materials developed for food contact; (ii) the global market and the future trends of active and intelligent packaging with a special emphasis on safety concerns and assessment; and (iii) the EU Legislation and compliance testing of these novel food packaging technologies.

Nathan Fiala, Meeting the demand: An estimation of potential future greenhouse gas emissions from meat production, Ecological Economics, Volume 67, Issue 3, 15 October 2008, Pages 412-419, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2007.12.021.
(http://www.sciencedirect.com/science/article/B6VDY-4RS3TJX-2/2/98e6f2f8683eb1f4092b706d38b39825)
Abstract:
Current production processes for meat products have been shown to have a significant impact on the environment, accounting for between 15% and 24% of current greenhouse gas emissions. Meat consumption has been increasing at a fantastic rate and is likely to continue to do so into the future. If this demand is to be met, technology used in production in the form of Confined Animal Feeding Operations (CAFOs) will need to be expanded. This paper estimates future meat consumption and discusses the potential aggregate environmental impact of this production if the use of CAFOs is expanded. I first separate meat into beef, chicken and pig products and estimate the elasticities associated with each product in order to forecast the world demand for meat. Using research on the environmental impact of food production in the US, which uses one of the most efficient CAFO processes in the world, I then calculate the total potential greenhouse emissions of this meat production and discuss the impact of these consumption patterns. I find that, under an expanded CAFO system, meat production in the future will still be a large producer of greenhouse gases, accounting for up to 6.3% of current greenhouse gas emissions in 2030.
Keywords: Meat consumption; Food demand; Environmental impact; Greenhouse gas emissions

Ashok Mishra, James W. Hansen, Michael Dingkuhn, Christian Baron, Seydou B. Traore, Ousmane Ndiaye, M. Neil Ward, Sorghum yield prediction from seasonal rainfall forecasts in Burkina Faso, Agricultural and Forest Meteorology, Volume 148, Issue 11, October 2008, Pages 1798-1814, ISSN 0168-1923, DOI: 10.1016/j.agrformet.2008.06.007.
(http://www.sciencedirect.com/science/article/B6V8W-4T53HFN-2/2/81b765fbdfdf8127cc9af85ba05ca44a)
Abstract:
The high variability of rainfall, from interannual to multi-decadal time scales, has serious impacts on food security in the West African Sahel. At five locations in Burkina Faso, we explore the potential to improve model-based prediction of sorghum yields at a range of lead-times by incorporating seasonal rainfall forecasts. Analyses considered empirical and dynamic rainfall forecasts, two methods (regression and stochastic disaggregation) for linking rainfall forecasts with crop simulation, three levels of production technology and four forecast dates (15 May, June, July and August) based on predictors observed from the preceding month, for the period of available data (1957-1998). Accuracy of yield forecasts generally decreased with lead-time. Relative to forecasts based solely on monitored weather and historic climatology, incorporating rainfall forecasts resulted in modest improvements to yield forecasts made in May or June. The benefit from seasonal rainfall forecasts tended to increase with northern latitude. Statistical and dynamic rainfall forecast systems captured much of the multi-decadal variation apparent in historic rainfall and in yields simulated with observed rainfall. This multi-decadal component of rainfall variability accounts for a portion of the apparent predictability of sorghum yields. Correlation between point-

scale crop yield simulations and district-scale production statistics (1984-1998) was weakly positive late in the season, and suggest that a dynamic crop model (SARRA-H) has potential to contribute to regional yield prediction beyond what the best linear regression can provide from seasonal rainfall or its predictors. We discuss avenues for further improving crop yield forecasts during the growing season.
Keywords: Yield forecasting; Seasonal climate prediction; Multi-decadal variability; Crop modeling; Sahel

M.E. Azim, D.C. Little, The biofloc technology (BFT) in indoor tanks: Water quality, biofloc composition, and growth and welfare of Nile tilapia (Oreochromis niloticus), Aquaculture, Volume 283, Issues 1-4, 1 October 2008, Pages 29-35, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2008.06.036.
(http://www.sciencedirect.com/science/article/B6T4D-4SW1445-1/2/40d85757e344faa0f47388bb0ce128d3)
Abstract:
The present study evaluates the biofloc technology (BFT) in light-limited tank culture of Nile tilapia (Oreochromis niloticus). Two biofloc treatments and one control were managed in 250 l indoor tanks: BFT fed a diet of 35% crude protein (CP), BFT fed a diet of 24% CP, and clean water control without biofloc with 35% CP. BFT tanks were aerated and agitated using a dome diffuser. Three kg of Nile tilapia were stocked in each tank. Feed was applied at 1.5% of the total fish biomass daily in each tank. Wheat flour was added in BFT tanks to maintain an optimum C:N ratio for heterotrophic production. The total suspended solid (TSS) level was maintained at around 500 mg l- 1 in BFT tanks.
The nutritional quality of biofloc was appropriate for tilapias. Fish survival was 100%. Net fish production was 45% higher in the BFT tanks than in the control tanks confirming the utilization of biofloc by fish as food. There was no difference in fish growth/production between 35% and 24% CP fed tanks under BFT. Welfare indicators in terms of fin condition, gill histology, proximate composition, blood haematocrit and plasma cortisol levels were compared and no significant differences between BFT and control tanks were recorded indicating no increased fish stress due to the presence of biofloc. However, overall fish growth and production was poor in terms of commercial feasibility. A modified system design that would allow enhanced feed and biofloc utilization is proposed.
Keywords: Biofloc; Activated suspension technique; Fish welfare; Tank culture; Tilapia

Lian Pin Koh, Jaboury Ghazoul, Biofuels, biodiversity, and people: Understanding the conflicts and finding opportunities, Biological Conservation, Volume 141, Issue 10, October 2008, Pages 2450-2460, ISSN 0006-3207, DOI: 10.1016/j.biocon.2008.08.005.
(http://www.sciencedirect.com/science/article/B6V5X-4TFH2HH-1/2/3310e8b838430cb638527ff91a8dd761)
Abstract:
The finitude of fossil fuels, concerns for energy security and the need to respond to climate change have led to growing worldwide interests in biofuels. Biofuels are viewed by many policy makers as a key to reducing reliance on foreign oil, lowering emissions of greenhouse gases and meeting rural development goals. However, political and public support for biofuels has recently been undermined due to environmental and food security concerns, and by reports questioning the rationale that biofuels substantially reduce carbon emissions. We discuss the promise of biofuels as a renewable energy source; critically evaluate the environmental and societal costs of biofuel use; and highlight on-going developments in biofuel feedstock selection and production technologies. We highlight net positive greenhouse gases emissions, threats to forests and biodiversity, food price increases, and competition for water resources as the key negative impacts of biofuel use. We also show that some of these environmental and societal costs may be

ameliorated or reversed with the development and use of next generation biofuel feedstocks (e.g., waste biomass) and production technologies (e.g., pyrolysis). We conclude that certain types of biofuels do represent potential sources of alternative energy, but their use needs to be tempered with a comprehensive assessment of their environmental impacts. Together with increased energy conservation, efficiencies and technologies such as solar-power and wind turbines, biofuels should be included in a diverse portfolio of renewable energy sources to reduce our dependence on the planet's finite supply of fossil fuels and to insure a sustainable future.
Keywords: Biodiesel; Ethanol; Energy crisis; Oil price; Food crisis; Water crisis

Yanling Gao, Fei Guo, Sumangala Gokavi, Andrew Chow, Qinghai Sheng, Mingruo Guo, Quantification of water-soluble vitamins in milk-based infant formulae using biosensor-based assays, Food Chemistry, Volume 110, Issue 3, 1 October 2008, Pages 769-776, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.03.007.
(http://www.sciencedirect.com/science/article/B6T6R-4S1C2RF-1/2/3aa59e4b694e172aef7acb1ad3bc0402)
Abstract:
Vitamin analysis is essential for quality control and development of functional foods. In this study, a biosensor-based technology developed by Biacore AB was evaluated for analysis of water-soluble vitamins B2, B12, folic acid, biotin, and pantothenic acid used to supplement infant formula samples. Performance parameters such as accuracy, repeatability and recovery for the five vitamins were studied. The repeatability was measured in terms of relative standard deviation (RSD) and HORRATr value. The RSD for all vitamins was below 2% and the values of HORRATr were 0.16, 0.10, 0.15, 0.11 and 0.22, for B2, B12, folic acid, biotin, and pantothenic acid, respectively. The recovery of vitamins ranged from 94.7% to 109.1%. Linear analyses indicated that the square of the correlation coefficient (R2) for B2, B12, folic acid, biotin, and pantothenic acid were 0.993, 0.997, 0.993, 0.993 and 0.995, respectively. The results showed that the biosensor-based vitamin analysis technology is a sensitive, reliable and realistic alternative to other methods.
Keywords: Water-soluble vitamins; Quantification; Biosensor; Infant formula

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

Qingyi Xu, Mitsutoshi Nakajima, Sosaku Ichikawa, Nobutaka Nakamura, Takeo Shiina, A comparative study of microbubble generation by mechanical agitation and sonication, Innovative Food Science & Emerging Technologies, Volume 9, Issue 4, October 2008, Pages 489-494, ISSN 1466-8564, DOI: 10.1016/j.ifset.2008.03.003.
(http://www.sciencedirect.com/science/article/B6W6D-4S7SV4P-1/2/afef362e25ecda5c4c0ce21d45973962)
Abstract:
As focus on the potential applications of microbubbles increases, information about the efficiency of generation methods and their effects on the properties and stability of microbubbles is crucial in the selection of an appropriate method to generate microbubbles with the desired properties. This paper evaluates the generation efficiencies of two commonly used methods, mechanical agitation

and sonication, in two surfactant systems. The results demonstrated that sonication was more effective than mechanical agitation in the generation of microbubbles in terms of higher gas hold-up, smaller bubble size, and larger interfacial area. Analysis of the changes in bubble size over time revealed that the existence of a critical diameter for the shrinkage of microbubbles. The behavior of microbubbles and the critical diameter depended on the generation method employed and the surfactant used.Industrial relevance
Microbubble technology has gradually become accepted as a cost-effective and environmentally friendly technology with great potential within almost every field of the food industry. Selection of a suitable method to generate microbubbles with the desired properties is crucial. Mechanical agitation and sonication are two commonly used methods for microbubble generation. However, systematic information on their generation efficiency and effects on the properties of microbubbles is not available. Thus, a comparative study was conducted in this paper.
Keywords: Microbubble; Mechanical agitation; Sonication; Gas hold-up; Interfacial area; Shrinkage

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

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

P.A. Luning, L. Bango, J. Kussaga, J. Rovira, W.J. Marcelis, Comprehensive analysis and differentiated assessment of food safety control systems: a diagnostic instrument, Trends in Food Science & Technology, Volume 19, Issue 10, October 2008, Pages 522-534, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.03.005.
(http://www.sciencedirect.com/science/article/B6VHY-4S3S2F6-1/2/3a2062344b7f8bc493a1d71403b66c1f)
Abstract:
In this article, an instrument is presented to diagnose microbial safety control activities in a food safety management system. The need of such a tool is derived from the importance of microbial safety control and the need for improvement of existing control systems. Careful diagnosis of these systems provides the basis for their improvement. The diagnostic instrument provides a comprehensive checklist of crucial control activities, addressing major technology-dependent and managerial activities in design and operation of preventive measures, intervention processes, and

monitoring systems. Secondly, it provides detailed grids describing three levels of execution for each safety control activity to enable a differentiated assessment of ones food safety control system situation. The basic assumption underlying the diagnostic instrument is that activities on a higher level are more predictable and better able to achieve a desired safety outcome, due to more insight in underlying mechanisms and more accurate information. Finally, we discuss that using the instrument may contribute in finding effective types and levels of control activities within given contextual dependencies.

Shuyan Cao, Gaodi Xie, Lin Zhen, Total embodied energy requirements and its decomposition in China's agricultural sector, Ecological Economics, In Press, Corrected Proof, Available online 16 September 2008, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2008.06.006.
(http://www.sciencedirect.com/science/article/B6VDY-4TFY491-1/2/5bc4f2bb308ffc6e4e98f0fe5aff4a5c)
Abstract:
Humanity faces the important challenge of understanding and integrating human and natural processes, including agriculture. In China, the scarcity of arable land (0.09 ha per capita), increasing population, and migration of the workforce to cities pose a significant challenge for food security. Agricultural energy productivity has therefore become a key concern. In this study, we used input-output analysis to measure energy productivity at a national agro-ecosystem scale for China using the total embodied energy requirement (TEER) to reveal hidden energy flows. We introduced a structural decomposition technique that reveals how changes in TEER for the agricultural sector were driven by changes in energy-use technology and the inter-relationships among two agricultural sectors (farming and animal husbandry). The results will help both policymakers and farmers to improve the efficiency and environmental compatibility of agricultural production. Declining TEER for both sectors means that China's overall agro-ecosystem has increased its energy productivity since 1978 due to improved relationships between the agricultural sectors and increased use of biological energy. However, the net positive energy income decreased in the farming sector and an increasing proportion of fossil energy use, accompanied by increased energy income in the animal sector, provide incentives to increase yield and decrease labor by using more fossil energy, thus raising more animals in the animal husbandry sector. Overuse of fossil energy since 1990 has resulted in decreasing fossil energy efficiency, requiring immediate measures to improve the use of fossil-fuel-intensive materials such as fertilizers.
Keywords: Energy use; Energy requirements; Input-output modeling; Decomposition analysis; Agricultural productivity; Energy efficiency

Primo Arambulo III, International programs and veterinary public health in the Americas--Success, challenges, and possibilities, Preventive Veterinary Medicine, Volume 86, Issues 3-4, Special Issue:Schwabe Symposia 2004-2006. Perspectives on Veterinary Epidemiology in Public Health, Animal Production and Preventive Medicine, 15 September 2008, Pages 208-215, ISSN 0167-5877, DOI: 10.1016/j.prevetmed.2008.02.008.
(http://www.sciencedirect.com/science/article/B6TBK-4S97J6N-1/2/46786cbffa304018cf130628f7181586)
Abstract:
The veterinary public health (VPH) program at the Pan American Health Organization (PAHO) began in 1949 when an arrangement with the newly founded World Health Organization made PAHO its Regional Office for the Americas to serve as the specialized health agency both for the Organization of American States and the United Nations. It started as a Section of Veterinary Medicine to help eradicate rabies on both sides of the US-Mexico border, and PAHO grew to be the biggest VPH program in the world. By providing a political and technical base, PAHO assisted its member states to organize and develop their national VPH programs and activities, and it

provides technical cooperation and works with their national counterparts to solve national and local problems.
In the 1980s and 1990s, PAHO concentrated that cooperation on several, specific needs: the elimination of dog-transmitted human rabies, hemispheric eradication of foot-and-mouth disease (FMD), regional action planning for food safety, control/eradication of bovine tuberculosis and brucellosis, and surveillance and prevention of emerging zoonoses and food-borne diseases. The Pan American centers developed a number of diagnostic antigens and a continental system for the surveillance of FMD and vesicular diseases, using geographic quadrant technology to augment sensitivity, analyze data, and make decisions. Another visible accomplishment is the elimination of hydatidosis in the endemic countries and regions of the southern cone.
In addition, the VPH program of PAHO pioneered the mobilization of the private sector to participate in official programs. Nevertheless, privatization of animal and human health services has had a negative effect on human resources and infrastructure by weakening essential epidemiological functions in some countries.
Today, there is a need for closer coordination between veterinary medicine and medical services. Practically all potential bioterrorism agents are zoonoses, and it is cost-effective to control them at the veterinary level, providing the first line of defense. The opportunities for VPH are boundless, but the challenge is to be able to apply the plethora of available research results and knowledge. What we will need is a new breed of veterinarians who will lead and provide us with a vision, like those we honored in 2005 at the Schwabe Symposium Honoring the Lifetime Achievements of Dr. James H. Steele: veterinarians in public health who will be in the forefront of policy setting, decision-making, and allocation of resources, and veterinarians who will articulate and provide a strategic direction to our unique professional skills.
Keywords: Epidemiology; Veterinary public health; Zoonoses; Control strategies

James Harlan Steele, Veterinary public health: Past success, new opportunities, Preventive Veterinary Medicine, Volume 86, Issues 3-4, Special Issue:Schwabe Symposia 2004-2006. Perspectives on Veterinary Epidemiology in Public Health, Animal Production and Preventive Medicine, 15 September 2008, Pages 224-243, ISSN 0167-5877, DOI: 10.1016/j.prevetmed.2008.02.014.
(http://www.sciencedirect.com/science/article/B6TBK-4S92XJ9-1/2/701fed3d26405728bf31c24257da8060)
Abstract:
Animal diseases are known to be the origin of many human diseases, and there are many examples from ancient civilizations of plagues that arose from animals, domesticated and wild. Records of attempts to control zoonoses are almost as old. The early focus on food-borne illness evolved into veterinary medicine's support of public health efforts. Key historical events, disease outbreaks, and individuals responsible for their control are reviewed and serve as a foundation for understanding the current and future efforts in veterinary public health. Animal medicine and veterinary public health have been intertwined since humans first began ministrations to their families and animals. In the United States, the veterinary medical profession has effectively eliminated those major problems of animal health that had serious public health ramifications. These lessons and experiences can serve as a model for other countries. Our past must also be a reminder that the battle for human and animal health is ongoing. New agents emerge to threaten human and animal populations. With knowledge of the past, coupled with new technologies and techniques, we must be vigilant and carry on.
Keywords: Veterinary Public Health; Food-borne illnesses; Historic outbreaks; Zoonoses

Michael Siegrist, Nathalie Stampfli, Hans Kastenholz, Carmen Keller, Perceived risks and perceived benefits of different nanotechnology foods and nanotechnology food packaging,

Appetite, Volume 51, Issue 2, September 2008, Pages 283-290, ISSN 0195-6663, DOI: 10.1016/j.appet.2008.02.020.
(http://www.sciencedirect.com/science/article/B6WB2-4S08JRC-1/2/cbae581906deee7aff287501e291c3d1)
Abstract:
Nanotechnology has the potential to generate new food products and new food packaging. In a mail survey in the German speaking part of Switzerland, lay people's (N = 337) perceptions of 19 nanotechnology applications were examined. The goal was to identify food applications that are more likely and food applications that are less likely to be accepted by the public. The psychometric paradigm was employed, and applications were described in short scenarios. Results suggest that affect and perceived control are important factors influencing risk and benefit perception. Nanotechnology food packaging was assessed as less problematic than nanotechnology foods. Analyses of individual data showed that the importance of naturalness in food products and trust were significant factors influencing the perceived risk and the perceived benefit of nanotechnology foods and nanotechnology food packaging.
Keywords: Food hazards; Nanotechnology; Risk perception; New technologies

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

Jean-Claude Ogier, Pascale Serror, Safety assessment of dairy microorganisms: The Enterococcus genus, 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 291-301, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.08.017.
(http://www.sciencedirect.com/science/article/B6T7K-4PGGNY3-6/2/a9e059831f811a5188ccccb0c7c7826d)
Abstract:

Unlike most of lactic acid bacteria, the Enterococcus genus is not considered 'generally recognized as safe' (GRAS). Safety assessment for enterococci remains controversial. While enterococci are considered 'positive" or useful in cheese technology, isolates of this genus have emerged as opportunistic pathogens for humans. Thus these bacteria have the paradoxical position of being useful in dairy fermentations, but also potentially dangerous. The aim of this review is to summarize both the positive and negative traits of enterococci that illustrate the controversial nature of this bacterial genus. According to food safety assessment guidelines, we propose a case-by-case evaluation of each potential technological strain and suggest several lines of research before using enterococci in fermented food products.
Keywords: Enterococcus; Taxonomy; Dairy use; Human safety; Virulence factors; Antibiotic resistance

Catherine Denis, Francoise Irlinger, Safety assessment of dairy microorganisms: Aerobic coryneform bacteria isolated from the surface of smear-ripened cheeses, 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 311-315, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.08.018.
(http://www.sciencedirect.com/science/article/B6T7K-4PGGNY3-7/2/288c034a52298a421afca5cc0dc2a934)
Abstract:
The group of 'coryneform bacteria" belongs to the class of Actinobacteria including a diverse and heterogeneous collection of bacteria of various genera. Most of them are known as environmental residents and/or commensal flora of humans and they are isolated frequently in clinical studies. Actinobacteria include also several aerobic species, present at the surface of smear-ripened cheeses for decades and used as ripening culture in the dairy industry. Their clinical significance is controversial because an easy combination of phenotypic and molecular methods to characterize Actinobacteria at the species level is still lacking. A bibliographical survey was conducted to assess the safety status of Actinobacteria species used as starter culture in fermented dairy foods, according to their technological interest. Aerobic coryneform bacteria isolated from smear-ripened cheeses are most commonly recovered from soil, the environment or food. To date, no clinical infection or food toxi-infection related to smear cheese coryneform bacteria ingestion has been reported. From a taxonomic viewpoint, dairy species are distant from the reference species associated with known pathologies. From a physiological viewpoint, cheese smear coryneform bacteria appear to be related to particular ecological niches: they are all oxidative species, and most are psychrotrophic and unable to grow at 37 [degree sign]C whereas medically relevant coryneform bacteria are facultative anaerobes and grow at 35-37 [degree sign]C. Consequently, technological strains must be selected according to taxonomic criteria (nonpathogenic species) and ecological criteria.
Keywords: Coryneform bacteria; Taxonomy; Dairy technology; Human safety; Innocuity status

Cedric O. Puleston, Shripad Tuljapurkar, Population and prehistory II: Space-limited human populations in constant environments, Theoretical Population Biology, Volume 74, Issue 2, September 2008, Pages 147-160, ISSN 0040-5809, DOI: 10.1016/j.tpb.2008.05.007.
(http://www.sciencedirect.com/science/article/B6WXD-4SR712F-1/2/06e515c90419b01333d2f6fcd183c959)
Abstract:
We present a population model to examine the forces that determined the quality and quantity of human life in early agricultural societies where cultivable area is limited. The model is driven by the non-linear and interdependent relationships between the age distribution of a population, its behavior and technology, and the nature of its environment. The common currency in the model is the production of food, on which age-specific rates of birth and death depend. There is a single

non-trivial equilibrium population at which productivity balances caloric needs. One of the most powerful controls on equilibrium hunger level is fertility control. Gains against hunger are accompanied by decreases in population size. Increasing worker productivity does increase equilibrium population size but does not improve welfare at equilibrium. As a case study we apply the model to the population of a Polynesian valley before European contact.
Keywords: Paleodemography; Demography; Density dependence; Population regulation; Carrying capacity; Food ratio; Hunger; Fertility control; Cultural adaptation; Quality of life; Taxation

David S. Wishart, Metabolomics: applications to food science and nutrition research, Trends in Food Science & Technology, Volume 19, Issue 9, September 2008, Pages 482-493, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.03.003.
(http://www.sciencedirect.com/science/article/B6VHY-4S32NKG-1/2/9aac6fbd23bfaa20a62f22f1cc2ed911)
Abstract:
Metabolomics is an emerging field of 'omics' research that focuses on high-throughput characterization of small molecule metabolites in biological matrices. As such, metabolomics is ideally positioned to be used in many areas of food science and nutrition research. This review focuses on the recent trends and potential applications of metabolomics in four areas of food science and technology: (1) food component analysis; (2) food quality/authenticity assessment; (3) food consumption monitoring; and (4) physiological monitoring in food intervention or diet challenge studies.

L.A. Hernandez-Herrero, M.J. Giner, M. Valero, Effective chemical control of psychrotrophic Bacillus cereus EPSO-35AS and INRA TZ415 spore outgrowth in carrot broth, Food Microbiology, Volume 25, Issue 5, August 2008, Pages 714-721, ISSN 0740-0020, DOI: 10.1016/j.fm.2008.02.004.
(http://www.sciencedirect.com/science/article/B6WFP-4S01WJF-1/2/af8222f5eb971c056ac6c4028358b999)
Abstract:
The growth kinetic parameters of germinated cells from heat-activated spores of the psychrotrophic Bacillus cereus EPSO-35AS strain in nutrient broth (NB) and in tyndallized carrot broth (TCB) were evaluated at different temperatures (8, 12, and 16 [degree sign]C) for control samples and for samples acidified with citric acid or lemon juice at pH values between 4.7 and 5.5. Lowering the pH from 7.4 or 6.2 to 5.2 inhibited bacterial growth in both tested media after 60 days at 12 [degree sign]C and lower temperatures, confirming the effectiveness of acidification in association with refrigeration to control B. cereus proliferation in minimally processed foods (MPFs) based on carrot. The activities of selected concentrations of cinnamon essential oil, cinnamaldehyde, carvacrol, and eugenol against B. cereus EPSO-35AS and INRA TZ415 strains in both media over the same temperature range were also studied. Addition of either cinnamon essential oil or cinnamaldehyde at concentrations of 5 and 2 [mu]L 100 mL-1, respectively, caused complete inhibition of the growth of both psychrotrophic strains even if mild temperature abuse occurred (12 [degree sign]C). Hence, a combination of one of these compounds and refrigerated storage may be useful for preservation of MPFs in which major ingredient was carrot. On the contrary, carvacrol and eugenol were not able to prevent B. cereus growth in TCB during storage at 8 [degree sign]C. Their effects on the organoleptic characteristics of TCB are discussed.
Keywords: Bacillus cereus; Hurdle technology; Food preservatives; Essential oil components; Minimally processed foods

Christopher B. Barrett, Smallholder market participation: Concepts and evidence from eastern and southern Africa, Food Policy, Volume 33, Issue 4, August 2008, Pages 299-317, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2007.10.005.

(http://www.sciencedirect.com/science/article/B6VCB-4RWHXGP-1/2/5eb4b5df7487aef4bef1a191fe7a08c4)
Abstract:
This paper reviews the evidence on smallholder market participation, with a focus on staple foodgrains (i.e., cereals) in eastern and southern Africa, in an effort to help better identify what interventions are most likely to break smallholders out of the semi-subsistence poverty trap that appears to ensnare much of rural Africa. The conceptual and empirical evidence suggests that interventions aimed at facilitating smallholder organization, at reducing the costs of intermarket commerce, and, perhaps especially, at improving poorer households' access to improved technologies and productive assets are central to stimulating smallholder market participation and escape from semi-subsistence poverty traps. Macroeconomic and trade policy tools appear less useful in inducing market participation by poor smallholders in the region.
Keywords: Food security; Market participation; Poverty traps; Price policy; Trade policy; Transactions costs

Oleg V. Petrov, Jill Hay, Igor V. Mastikhin, Bruce J. Balcom, Fat and moisture content determination with unilateral NMR, Food Research International, Volume 41, Issue 7, August 2008, Pages 758-764, ISSN 0963-9969, DOI: 10.1016/j.foodres.2008.05.010.
(http://www.sciencedirect.com/science/article/B6T6V-4SRCJKT-1/2/549454b787511c7a2edfbc0b5342b2a5)
Abstract:
Unilateral (one-sided) NMR, with easy sample access and rapid 'through-package' measurement, is a promising new technology in food science. Here we investigated the applicability of two methods for fat and moisture content determination by unilateral NMR. One is a post-measurement decomposition of a Carr-Purcell-Meiboom-Gill (CPMG) signal using a classical least-squares (CLS) multivariate analysis. The other is based on a diffusion-weighted CPMG experiment, where the components are discriminated at the time of measurement through the diffusivity difference between fat and moisture. The experiments were carried out on model samples of cod liver oil emulsion in water and on commercial ground beef. The CLS analysis exhibits a good predictive performance provided the fat and moisture components conserve their characteristic relaxation times in different samples. The diffusion-weighted CPMG, although more complex experimentally, is free of this restriction. The methods will be of interest for online analysis of food materials and supplement laborious standard extraction methods.
Keywords: Unilateral NMR; Food; CPMG; Multivariate analysis; Diffusion

B.K. Boogaard, S.J. Oosting, B.B. Bock, Defining sustainability as a socio-cultural concept: Citizen panels visiting dairy farms in the Netherlands, Livestock Science, Volume 117, Issue 1, August 2008, Pages 24-33, ISSN 1871-1413, DOI: 10.1016/j.livsci.2007.11.004.
(http://www.sciencedirect.com/science/article/B7XNX-4RNK46K-1/2/ca19be7b1996e261b169bffdd7b520e5)
Abstract:
The important role of values is very evident when it comes to citizens' concept of sustainability. The present paper had the objective to define sustainability as a socio-cultural concept for livestock production systems. The main research question was: how do Dutch citizens value various aspects of dairy production systems? We conducted farm visits with citizens panels in The Netherlands. We asked citizens about their on-farm perception (smelling, hearing, seeing and feeling) and what they perceived valuable to preserve for the future. We presented sustainability as a socio-cultural concept which included citizens' valuable aspects (SCA) and concerns (SCI). We defined a socio-cultural aspect (SCA) as an aspect of a livestock production system which is mentioned by society as being valuable to preserve for the future. We identified an SCA as a socio-cultural issue (SCI) when it evokes societal concern in present time or is expected to do so

in the future. By qualitative analysis we identified SCAs and SCIs of dairy production systems and combined these into socio-cultural themes (SCT). We found ten socio-cultural themes which contained 42 socio-cultural aspects (SCA), of which 27 were identified as socio-cultural issues (SCI). We can conclude that that livestock production systems have more values for society than solely food production, because only one of the ten identified socio-cultural themes directly concerned food production (SCT 1), whereas the nine other themes concerned values that go beyond food production: farming activities (SCT 2), farm income (SCT 3), animals (SCT 4), landscape (SCT 5), nature (SCT 6), environment (SCT 7), farming culture (SCT 8), national culture (SCT 9) and services for society (SCT 10). One of the main values of agriculture seems the combination of apparently contradicting aspects such as technology and nature within one system. In conclusion, sustainability as a socio-cultural concept for livestock production systems is defined by a wide range of socio-cultural aspects and issues, reflecting citizens' values and concerns of that system and for a sustainable agriculture it is important that both SCIs and SCAs are taken into account.
Keywords: Dairy production; Society; Culture; Values; Issues; Farm visits

Peter Raspor, Total food chain safety: how good practices can contribute?, Trends in Food Science & Technology, Volume 19, Issue 8, Central European Congress on Food - CEFood, August 2008, Pages 405-412, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.08.009.
(http://www.sciencedirect.com/science/article/B6VHY-4PP2CRT-1/2/677e6b5fccff06a41fd36c83f0c65294)
Abstract:
Consumer concern about treats associated with food is growing. Due to recent food crises in Europe, food quality and food safety have become a hot topic in mass media. 'Food safety' is a broader term, which means an assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use. Today we master food safety with different good practices which are the consequence of human culture, history and lifestyle. If we analyse good practices in the broad spectre of food area we could arrange them in three categories. First category of good practices is directly connected with food technology (i.e., Good Manufacturing Practice - GMP). Second category is indirectly connected with food issues (i.e., Good Research Practice - GRP, Good Educational Practice - GEP, Good Training Practice - GTrP). Third category deals with all the activities regarding consumers' food handling (Good Housekeeping Practice - GHKP). Consumers are not connected to food supply chain according to chain principles. Consumer behaviour and attitudes toward food safety have shown that the levels of understanding, motivation and trust need to be further cultivated. It has been shown that present maintenance of food safety in food supply chain can be easily broken down, because of different kind of barriers or simple misunderstanding. Therefore a new approach called 'Good Nutritional Practice' (GNP) was coined to manage food safety. It is important to reconstruct the existent food safety system with GNP which includes consumers, and is based on a model that covers subsystems from other good practices. Food safety point of view should be focused on knowledge, constant education and exchange of information. 'From Farm to Table' approach is a philosophy with an important goal: safe and healthy food for all consumers. With this aspect in mind, we are building foundation for Good Life Practice.

D. Banati, Fear of food in Europe? Fear of foods in Europe through Hungarian experience, Trends in Food Science & Technology, Volume 19, Issue 8, Central European Congress on Food - CEFood, August 2008, Pages 441-444, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.04.004.
(http://www.sciencedirect.com/science/article/B6VHY-4SCDB0F-1/2/fd58c72b16224850cdf640f100a10cf4)
Abstract:

Nearly half of European consumers think that the food they eat damages their health. Consumers fear of the unknown the most. Therefore, accurate, reliable and well-timed information about risks is crucial from competent authorities to insure consumers' safety, measure their risk perception and there is a need to avoid overreaction or hysteria of consumers under real or possible food safety threats. The ever-emerging risks, the fear of the unknown, especially of new techniques and technologies and anything considered to be 'unnatural' or artificial or hard to be understood make consumers worried despite the safety of their food declared by experts. Sensitising consumers might be important in the light of an emerging risk or in case of a worsening food safety situation or an emerging outbreak, but an exaggerated warning campaign could lead to lost sensitivity, especially upon repetition. The level of fear would increase furthermore if a well-trusted, valuable regional or national product affected.

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

Virve Hagren, Piia von Lode, Anniina Syrjala, Teemu Korpimaki, Mika Tuomola, Otto Kauko, Jussi Nurmi, An 8-hour system for Salmonella detection with immunomagnetic separation and homogeneous time-resolved fluorescence PCR, International Journal of Food Microbiology, Volume 125, Issue 2, 15 July 2008, Pages 158-161, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2008.03.037.
(http://www.sciencedirect.com/science/article/B6T7K-4S6P1VJ-2/2/b0b2f73367557ee8f0e4b1e035621a13)
Abstract:
We describe a system consisting of rapid sample enrichment and homogeneous end-point PCR analysis that enables the detection of Salmonella in various food matrices in 8 h. Sample preparation starts with 6 h enrichment step in supplemented broth, after which Salmonella cells are collected with immunomagnetic particles. The particles are washed and dispensed to ready-to-use PCR reaction vessels, which contain dried assay-specific reagents and an internal amplification control. PCR is performed with a novel instrument platform utilising the sensitive label technology of time-resolved fluorometry. Qualitative assay results are automatically interpreted and available in 45 min after sample addition. The overall accuracy, sensitivity and specificity of the Magda(TM) CA Salmonella system were 99.1%, 98.4% and 100.0%, respectively, based on the evaluation of 107 samples (beef, pork, poultry and ready-to-eat meals) artificially contaminated with sub-lethally injured Salmonella cells.
Keywords: Salmonella; Immunomagnetic separation; Homogeneous assay; PCR; Time-resolved fluorometry; Dry chemistry

A. Milstein, A. Kadir, M.A. Wahab, The effects of partially substituting Indian carps or adding silver carp on polycultures including small indigenous fish species (SIS), Aquaculture, Volume 279, Issues 1-4, 2 July 2008, Pages 92-98, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2008.04.009.
(http://www.sciencedirect.com/science/article/B6T4D-4S8K9F7-5/2/3bbad157f930fa705306ee501f8076fc)
Abstract:
A sustainable semi-intensive pond aquaculture technology including major carp species (Indian, Chinese and common carp) as cash-crop and small indigenous fish species (SIS) as food for the farmers' families is being optimized in Bangladesh. Silver carp inclusion in the polyculture is now being considered, because this very efficient filter feeder has a strong impact on pond ecology and also on the farmers' family nutrition because it is a cheap fish that the family can afford to eat instead of selling. The present paper is centered on the reduction of silver carp negative effects on other species while keeping the advantages of increased total yield and income due to silver carp stocking. It presents the results of two experiments, one on-station and one on-farm, in which 3-5 silver carp/100 m2 were added or partially substituted major carp filter feeders. The basic stocking density was 100 carps (rohu, catla and a bottom feeder, either mrigal or common carp, at a 1:1:1 ratio) and 250 SIS (punti and mola) per 100 m2. In the on-station experiment silver carp density was 3 and 5 fish/100 m2 and the large carp bottom feeder was common carp. In the on-farm experiment silver carp density was 5 fish/100 m2 and the bottom feeder was either common carp or mrigal.
Most of the water quality and fish performance parameters tested were not affected by the polyculture composition. Adding 3-5% silver carp or substituting 3-5% of the herbivorous fish species by this highly efficient filter feeder increased grazing pressure on the phytoplankton, which led to a 25-40% reduction of the chlorophyll concentration in the water column. The increased grazing pressure was not enough to affect other water quality parameters and fewer effects on the availability of food for the other fish species occurred than when the silver carp addition was 10% of the polyculture, as reported in a previous work. The strong negative effects of silver carp on the other species of the polyculture and the higher total yields and income recorded in previous experiments with the addition of 10 silver carp/100 m2 were much weaker and their expression depended on other pond conditions when 3 or 5 silver carp/100 m2 were added or substituted the same number of rohu or catla, either when the bottom feeder was mrigal or common carp. It was concluded that stocking 3 silver carp/100 m2 over the usual 100 large carp and 250 SIS /100 m2 can be considered a `no effect' stocking density in relation to the control without silver carp, while stocking 10 silver carp/100 m2 should be preferred by farmers to keep the option of selling or consuming the silver carp.
Keywords: Fish interactions; Natural food web; Polyculture; SIS small indigenous species

Glenn Hyman, Sam Fujisaka, Peter Jones, Stanley Wood, M. Carmen de Vicente, John Dixon, Strategic approaches to targeting technology generation: Assessing the coincidence of poverty and drought-prone crop production, Agricultural Systems, Volume 98, Issue 1, July 2008, Pages 50-61, ISSN 0308-521X, DOI: 10.1016/j.agsy.2008.04.001.
(http://www.sciencedirect.com/science/article/B6T3W-4SNYF3T-1/2/15b941b022ba5ec535391c69ac7e7d5a)
Abstract:
The world's poorest and most vulnerable farmers on the whole have not benefited from international agricultural research and development. Past efforts have tried to increase the production of countries in more favourable environments; farmers with relatively higher potential for improvement benefited most from these advances. Current and future crop improvement efforts will focus more on marginal environments, especially those prone to drought. The objective of this research is to guide crop improvement efforts by prioritizing areas of high poverty, the key problem of high drought risk and the crops grown and consumed in these areas. Global spatial data on

crop production, climate and poverty (as proxied by child stunting) were used to identify geographic areas of high priority for crop improvement. The analysis employed spatial overlay, drought modelling and descriptive statistics to identify where best to target technology generation to achieve its intended human welfare goals. Analysis showed that drought coincides with high levels of poverty in 15 major farming systems, especially in South Asia, the Sahel and eastern and southern Africa, where high diversity in drought frequency characterizes the environments. Thirteen crops make up the bulk of food production in these areas. A database was developed for use in agricultural research and development targeting and priority setting to raise the productivity of crops on which the poor in marginal environments depend.
Keywords: Farming systems; Child stunting; Drought; Staple food crops; Risk

V. Nangia, C. de Fraiture, H. Turral, Water quality implications of raising crop water productivity, Agricultural Water Management, Volume 95, Issue 7, July 2008, Pages 825-835, ISSN 0378-3774, DOI: 10.1016/j.agwat.2008.02.014.
(http://www.sciencedirect.com/science/article/B6T3X-4S9R878-2/2/8ac743a1e4929d0aceaf2be454cf91eb)
Abstract:
Because of a growing and more affluent population, demand for agricultural products will increase rapidly over the coming decades, with serious implications for agricultural water demand. Symptoms of water scarcity are increasingly apparent, threatening ecosystem services and the sustainability of food production. Improved water productivity will reduce the additional water requirements in agriculture. However, there is a tradeoff between the quantity of water used in agriculture and the quality of return flow. Where yields are low due to limited nitrogen (N) and water supply, water productivity can be enhanced through higher fertilizer applications and improved water management. This limits the amount of additional water needed for increased food demand, thus leaving more water for environmental requirements. But it also increases the amount of nitrate (NO3-N) leaching, thus adversely affecting the water quality of return flows.
This paper quantifies the tradeoff between enhanced water productivity and NO3-N leaching and shows the importance of the right management of water and N applications. Using the Decision Support System for Agro-technology Transfer (DSSAT) crop model, several scenarios combining different water and N application regimes are examined for maize (Zea mays L.) in Gainesville, FL, USA. Without adequate water, nitrogen use efficiency (NUE) remains low, resulting in substantial NO3-N leaching. Too much water leads to excessive NO3-N leaching and lower water productivity. The lack of N is a cause of low water productivity but too much of it leads to lower NUE and higher losses. The paper concludes that increased NO3-N leaching is an inevitable by-product of increased water productivity, but its adverse impacts can greatly be reduced by better management of water and N application. The paper briefly shows that leaching can be reduced and water productivity increased by split application of N-fertilizer. This implies that improved water and nutrient management at field- and scheme-level is a prerequisite to limit adverse impacts of agriculture on ecosystems, now and especially in the future.
Keywords: Water quality; DSSAT; Water productivity; Nitrate leaching; NUE

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

Yu Wang, Chi-Tang Ho, Effects of o-phenylenediamine on methylglyoxal generation from monosaccharide: Comment on 'correlation of methylglyoxal with acrylamide formation in fructose/asparagine Maillard reaction model system', Food Chemistry, Volume 109, Issue 1, 1 July 2008, Pages 1-3, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.01.025.
(http://www.sciencedirect.com/science/article/B6T6R-4RMNYM1-J/2/613098a4ecd3eeaa818917c0d3601575)
Abstract:
Methylglyoxal (MG), a reactive carbonyl compound, has recently garnered much attention because of its ability to modify proteins over time and yield advanced glycation end products (AGEs) that are thought to contribute to the development of diabetes mellitus and its complications. In a recent paper published in Food Chemistry by Yuan et al. [Yuan, Y., Zhao, G. H., Hu, X. S., Wu, J. H., Liu, J., & Chen, F. (2007a). Correlation of methylglyoxal with acrylamide formation in fructose/asparagines Maillard reaction model system. Food Chemistry, 108(3), 885-890] authors showed a high correlation between methylglyoxal formation and acrylamide formation. However, in their study, model systems of aqueous fructose/asparagines (Fru/Asn) and fructose/asparagines/o-phenylenediamine (Fru/Asn/OPD) heating at 150 [degree sign]C were used. The validity of these models relies on the assumption that OPD will only serve the role of a trapping agent for MG. In this short communication, we would like to call to attention that MG can also have a strong catalytic effect in the generation of MG from fructose. Therefore, it is concluded that the concentration of MG obtained in Fru/Asn/OPD model system cannot correspond to the total amount of MG formed by Maillard reaction of Fru and Asn as claimed by Yuan et al. [Yuan, Y., Zhao, G. H., Hu, X. S., Wu, J. H., Liu, J., & Chen, F. (2007a). Correlation of methylglyoxal with acrylamide formation in fructose/asparagines Maillard reaction model system. Food Chemistry, 108(3), 885-890, Yuan, Y., Zhao, G. H., Hu X. S., Wu, J. H., Liu, J., & Chen. F. (2007b). High correlation of methylglyoxal with acrylamide formation in glucose/asparagine Maillardreaction model. European Food Research and Technology. doi:10.1007/s00217-007-0658-0].
Keywords: o-Phenylenediamine; Methylglyoxal; Maillard reaction; Amine-assisted sugar degradation

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

C. Riverol, G. Ricart, C. Carosi, C. Di Santis, Application of advanced soft control strategies into the dairy industry, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 298-305, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.07.002.
(http://www.sciencedirect.com/science/article/B6W6D-4PC8RJY-1/2/1df5baa21d7412235c670f5a5cf6b16e)
Abstract:
This paper outlines the application of soft control strategies in the thermal treatment in the dairy industry. The milk pasteurizer is the most important process for guarantee the quality of the milk. The article describes with details the application of fuzzy logic and neural network in a plate heat exchanger (PHE). Recently the application of artificial intelligent has increased sharply, especially, fuzzy logic due to its easy implementation and low mathematical level. This article discusses technical features of three advanced control technologies: Fuzzy control, Model Reference Adaptive Fuzzy Control and neural networks, their implementation in food processes including a comparative study.Industrial relevance
Existing control does not permit to introduce the experience of the operator for an adequate control of the milk pasteurization in industrial applications. Consequently, it was the aim of this very relevant to test the efficiency of soft techniques (fuzzy logic and neural networks) to control the temperature during milk pasteurization. The uses of soft techniques do not require complex mathematical models and complex tuning control methods. Since the controller can be realized by simple arithmetic operations, it can be improved continuously.
Keywords: Milk pasteurization; Fuzzy control; Neural network; Adaptive control; Dairy

Maricel Keyser, Ilze A. Muller, Frans P. Cilliers, Wihann Nel, Pieter A. Gouws, Ultraviolet radiation as a non-thermal treatment for the inactivation of microorganisms in fruit juice, Innovative Food Science & Emerging Technologies, Volume 9, Issue 3, July 2008, Pages 348-354, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.09.002.
(http://www.sciencedirect.com/science/article/B6W6D-4R40SN5-2/2/222742afa86352114694a2f7d947fb26)
Abstract:
Fruit juices can be processed using ultraviolet (UV-C) light to reduce the number of microorganisms. The UV-C wavelength of 254 nm is used for the disinfection and has a germicidal effect against microorganisms. A novel turbulent flow system was used for the treatment of apple

juice, guava-and-pineapple juice, mango nectar, strawberry nectar and two different orange and tropical juices. In comparison to heat pasteurization, juices treated with UV did not change taste and color profiles. Ultraviolet dosage levels (J L- 1) of 0, 230, 459, 689, 918, 1 148, 1 377, 1 607 and 2 066 were applied to the different juice products in order to reduce the microbial load to acceptable levels. UV-C radiation was successfully applied to reduce the microbial load in the different single strength fruit juices and nectars but optimization is essential for each juice treated. This novel UV technology could be an alternative technology, instead of thermal treatment or application of antimicrobial compounds.Industrial relevance
This novel UV-C system can be applied successfully to the Food Industry. UV-C can be effectively used to reduce the number of spoilage and pathogenic bacteria, as well as yeasts and moulds in different kinds of fruit juices.
Keywords: Aerobic plate count; Fruit juices; Microbial inactivation; Novel UV system; Ultraviolet radiation

Evzen Sarka, Zdenek Bubnik, Pavel Kadlec, Anezka Vesela-Trilcova, The particle size of carbonation mud, and possibilities for influencing it, 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 45-50, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.05.023.
(http://www.sciencedirect.com/science/article/B6T8J-4NVT9N2-2/2/18d0fb1942f02d280ca0be68ce947980)
Abstract:
The waste precipitate from sugar technology called carbonation mud contains CaCO3 and aggregated or adsorbed non-sugars. The authors considered feasible applications of carbonation mud - both inside and outside the sugar plant. The granulometric distribution of carbonation mud is among its basic properties. The authors chose image analysis, combined with microscopic observation using the LUCIA system, to determine particle parameters. Particle size distribution was measured and used to evaluate some full-scale chemical-engineering operations, such as the application of flocculants, particle damage by mixing and hydrocyclone separation. The authors established that the industrial method of preparing input mud suspension for hydrocyclone separation is not fine enough and that, compared to unfiltered first carbonation juice, the amount of small particles increased. As a result, the bottom output suspension of the hydrocyclones was of worse quality.
Keywords: Carbonation mud; Particle size distribution; Hydrocyclones; Wastes from food technology; Image analysis

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

Jeannie Sneed, Catherine H. Strohbehn, Trends Impacting Food Safety in Retail Foodservice: Implications for Dietetics Practice, Journal of the American Dietetic Association, Volume 108, Issue 7, July 2008, Pages 1170-1177, ISSN 0002-8223, DOI: 10.1016/j.jada.2008.04.009.
(http://www.sciencedirect.com/science/article/B758G-4SV7KCR-M/2/53a417a454ef42ea90366132d58ada37)
Abstract:
Food safety in retail foodservice is increasingly important to consumers. Trends that impact food safety concerns include the increasing number of meals eaten away from home, increasing consumer awareness about food safety, an aging population, changes in the foodservice workforce, changing technology in work environments, changes in food procurement, foodservice risk factors, and food defense concerns. Each of these trends has implications for dietetics practice, both in working with consumers and managing foodservice operations.

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

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

Mohammed Aider, Damien de Halleux, Laurent Bazinet, Potential of continuous electrophoresis without and with porous membranes (CEPM) in the bio-food industry: review, Trends in Food Science & Technology, Volume 19, Issue 7, July 2008, Pages 351-362, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.12.008.
(http://www.sciencedirect.com/science/article/B6VHY-4RDXJSN-1/2/2a71ee4585996b3c94a45ecc81cafb95)
Abstract:
During the last 50 years, membrane-based technologies have evolved from a laboratory to industrial scale and showed significant technical and commercial impact. Today membrane-based technologies are receiving considerable attention and are successfully used for desalination of sea and brackish waters, treatment of different industrial effluents. They are efficient tools and offer smooth conditions for concentration, separation as well as purification of food and pharmaceutical products containing ionic species or charged biologically active molecules. The evolution of different membrane-based technologies makes several processes cleaner and more energetically efficient, and thus the development and use of these technologies contributes more and more to their sustainable use in different areas in bio-food industry, biotechnology, pharmaceutical and nutraceuticals industries. One of the recent developments in membrane-based technologies is a hybrid process consisting in combination between conventional electrodialysis and different porous membranes such as microfiltration, ultrafiltration and nanofiltration membranes. Therefore, this review is aimed to give a brief summary of the different characteristics and application possibilities in the above mentioned fields of electrodialysis combined with porous membranes. The most relevant literature data in the given field are surveyed and some elucidating case studies are discussed, also accounting for the results of some research programs carried on different subjects, especially those related to the bio-food industry.

Cesar Vega, Job Ubbink, Molecular gastronomy: a food fad or science supporting innovative cuisine?, Trends in Food Science & Technology, Volume 19, Issue 7, July 2008, Pages 372-382, ISSN 0924-2244, DOI: 10.1016/j.tifs.2008.01.006.

(http://www.sciencedirect.com/science/article/B6VHY-4RNR6WC-1/2/dfd923d0c92364b57c54071919ae930b)
Abstract:
The concepts, history and approaches of molecular gastronomy are discussed with an emphasis on the relation to food science and technology. A distinction is made between molecular gastronomy and science-based cooking, where the first relates to the scientific understanding of the cooking and eating processes and the latter refers to the application of the principles and tools from science for the development of new dishes, particularly in the context of haute cuisine. We argue that science-based cooking is closely associated with significant technological developments, as the realization of novel dishes frequently requires the use of non-traditional ingredients or preparation techniques, which are often derived from those used in industrial food production. Several approaches towards the scientific understanding of foods are highlighted, including the complex disperse system (CDS) formalism of This and the systematic compilation and interpretation of scientific and non-scientific information relating to foods, their ingredients and preparation methods as shaped into its modern form by McGee. We discuss how chefs are dealing with the available systematic knowledge on food and cooking, and how molecular gastronomy can facilitate the cumbersome, but much needed discussions among food scientists and chefs. Finally, we discuss the implications of molecular gastronomy for society. This includes the way the general public is considering food, and how molecular gastronomy could inspire food technologists to increasingly emphasize aspects relating to food origin, quality, and creativity in their product development efforts.

Gaetan Vanloqueren, Philippe V. Baret, Why are ecological, low-input, multi-resistant wheat cultivars slow to develop commercially? A Belgian agricultural `lock-in' case study, Ecological Economics, Volume 66, Issues 2-3, 15 June 2008, Pages 436-446, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2007.10.007.
(http://www.sciencedirect.com/science/article/B6VDY-4R5G893-2/2/1677175d7668d699a14e11f4c0dc7a84)
Abstract:
The use of multi-resistant cultivars allows a significant reduction in fungicide use in low-input cropping systems. However, many major wheat cultivars used in Europe remain sensitive to frequent diseases and require fungicide protection. This paper aims at understanding the factors explaining the low level of adoption of multi-resistant wheat cultivars in Wallonia (Belgium). Cultivar adoption has been an important topic of research, but few analyses have been done in Europe in the past decades. We used a systems approach combining a survey among stakeholders in the food chain and a systematic analysis of the publications of extension services. We identified twelve factors impeding wider adoption of multi-resistant cultivars. These factors explain why current wheat-cropping systems are maintained in a `pesticide lock-in' situation, an economic concept that could be used more frequently to study agricultural innovations. Considering these intangible `barriers' to current and forthcoming innovations is a first step towards a more comprehensive policy to promote sustainable agriculture. Similarities between Wallonia and France are discussed and methods of promoting wide use of resistant cultivars are proposed.
Keywords: Technology adoption; Agricultural innovations; Integrated pest management; Pesticide lock-in; wheat

P. De Schryver, R. Crab, T. Defoirdt, N. Boon, W. Verstraete, The basics of bio-flocs technology: The added value for aquaculture, Aquaculture, Volume 277, Issues 3-4, 3 June 2008, Pages 125-137, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2008.02.019.
(http://www.sciencedirect.com/science/article/B6T4D-4RVG3G8-1/2/f2396c1d24cdaf10026c0461164ede1d)

Abstract:
The expansion of the aquaculture production is restricted due to the pressure it causes on the environment by the discharge of waste products in the water bodies and by its dependence on fish oil and fishmeal. Aquaculture using bio-flocs technology (BFT) offers a solution to both problems. It combines the removal of nutrients from the water with the production of microbial biomass, which can in situ be used by the culture species as additional food source. Understanding the basics of bio-flocculation is essential for optimal practice. Cells in the flocs can profit from advective flow and as a result, exhibit faster substrate uptake than the planktonic cells. The latter mechanisms appear to be valid for low to moderate mixing intensities as those occurring in most aquaculture systems (0.1-10 W m- 3). Yet, other factors such as dissolved oxygen concentration, choice of organic carbon source and organic loading rate also influence the floc growth. These are all strongly interrelated. It is generally assumed that both ionic binding in accordance with the DLVO theory and Velcro-like molecular binding by means of cellular produced extracellular extensions are playing a role in the aggregation process. Other aggregation factors, such as changing the cell surface charge by extracellular polymers or quorum sensing are also at hand. Physicochemical measurements such as the level of protein, poly-[beta]-hydroxybutyrate and fatty acids can be used to characterize microbial flocs. Molecular methods such as FISH, (real-time) PCR and DGGE allow detecting specific species, evaluating the maturity and stability of the cooperative microbial community and quantifying specific functional genes. Finally, from the practical point of view for aquaculture, it is of interest to have microbial bio-flocs that have a high added value and thus are rich in nutrients. In this respect, the strategy to have a predominance of bacteria which can easily be digested by the aquaculture animals or which contain energy rich storage products such as the poly-[beta]-hydroxybutyrate, appears to be of particular interest.
Keywords: Aquaculture; Bio-flocs technology; Bacterial aggregates; Fish feed; C/N-ratio

Rodomiro Ortiz, Kenneth D. Sayre, Bram Govaerts, Raj Gupta, G.V. Subbarao, Tomohiro Ban, David Hodson, John M. Dixon, J. Ivan Ortiz-Monasterio, Matthew Reynolds, Climate change: Can wheat beat the heat?, Agriculture, Ecosystems & Environment, Volume 126, Issues 1-2, International Agricultural Research and Climate Change: A Focus on Tropical Systems, June 2008, Pages 46-58, ISSN 0167-8809, DOI: 10.1016/j.agee.2008.01.019.
(http://www.sciencedirect.com/science/article/B6T3Y-4S0R6HH-2/2/f3dcefe4da500c1d138c25d0a49a12d3)
Abstract:
Climate change could strongly affect the wheat crop that accounts for 21% of food and 200 million hectares of farmland worldwide. This article reviews some of the approaches for addressing the expected effects that climate change may likely inflict on wheat in some of the most important wheat growing areas, namely germplasm adaptation, system management, and mitigation. Future climate scenarios suggest that global warming may be beneficial for the wheat crop in some regions, but could reduce productivity in zones where optimal temperatures already exist. For example, by 2050, as a result of possible climate shifts in the Indo-Gangetic Plains (IGPs) - currently part of the favorable, high potential, irrigated, low rainfall mega-environment, which accounts for 15% of global wheat production - as much as 51% of its area might be reclassified as a heat-stressed, irrigated, short-season production mega-environment. This shift would also represent a significant reduction in wheat yields, unless appropriate cultivars and crop management practices were offered to and adopted by South Asian farmers. Under the same climate scenarios, the area covered by the cool, temperate wheat mega-environment could expand as far as 65[degree sign]N in both North America and Eurasia. To adapt and mitigate the climate change effects on wheat supplies for the poor, germplasm scientists and agronomists are developing heat-tolerant wheat germplasm, as well as cultivars better adapted to conservation agriculture. Encouraging results include identifying sources of alleles for heat tolerance and their introgression into breeding populations through conventional methods and biotechnology.

Likewise, agronomists and extension agents are aiming to cut CO2 emissions by reducing tillage and the burning of crop residues. Mitigation research promises to reduce emissions of nitrous oxide by using infrared sensors and the normalized differential vegetative index (NDVI) that determines the right times and correct amounts of fertilizer to apply. Wheat geneticists and physiologists are also assessing wild relatives of wheat as potential sources of genes with inhibitory effects on soil nitrification. Through the existing global and regional research-for-development networks featuring wheat, technology and knowledge can flow to allow farmers to face the risks associated with climate change.
Keywords: Triticum aestivum; Climate change; Conservation agriculture; Genetic enhancement; Mega-environment; Wheat

Zeyaur R. Khan, David M. Amudavi, Charles A.O. Midega, Japhether M. Wanyama, John A. Pickett, Farmers' perceptions of a `push-pull' technology for control of cereal stemborers and Striga weed in western Kenya, Crop Protection, Volume 27, Issue 6, June 2008, Pages 976-987, ISSN 0261-2194, DOI: 10.1016/j.cropro.2007.12.001.
(http://www.sciencedirect.com/science/article/B6T5T-4RKDHHB-2/2/4ac0edcedf8407afcb685cb14af1a3af)
Abstract:
Striga and cereal stemborers are major constraints to cereal production in sub-Saharan Africa causing serious food security concerns. The International Centre of Insect Physiology and Ecology (ICIPE) and partners have developed a novel integrated management system called the `push-pull' technology (PPT) in mitigation. This involves inter-cropping maize with a stemborer moth-repellent forage legume, silverleaf desmodium (push), and planting an attractive trap crop, Napier grass (pull), around the intercrop. Additionally, chemicals produced from desmodium roots inhibit Striga. We evaluated farmers' perceptions of the pests, PPT attributes and factors influencing the likelihood of its adoption in 15 districts in western Kenya. A random sample of 923 farmers, with 478 having adopted the technology (practicing) and 445 not yet adopted but attending PPT field days (visiting) were interviewed. The practicing farmers cited both Striga and stemborers as major maize production constraints, alongside other constraints, as the main motivations for adoption of PPT. Reduced infestation by the pests, improvement in soil fertility, increase in maize grain yields, improved fodder and milk productivity were cited as main benefits of PPT. Similarly, the field day visiting farmers rated PPT as a more superior technology compared to their own maize production practices. Farmer's age, household headship by female farmers, technology attributes and exposure to a variety of extension methods significantly influenced likelihood of PPT adoption. Effective dissemination pathways are needed to provide farmers with appropriate information for evaluating potential benefits and tradeoffs of such a management-intensive technology. Further research is needed to understand how PPT contributes to farmers' livelihood improvement and how the efficacy of different dissemination pathways in PPT technology transfer influences its adoption.
Keywords: Farmer perceptions; Striga; Stemborers; `Push-pull' technology; Kenya

Andreas Boecker, Jochen Hartl, Giuseppe Nocella, How different are GM food accepters and rejecters really? A means-end chains application to yogurt in Germany, Food Quality and Preference, Volume 19, Issue 4, June 2008, Pages 383-394, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2007.11.006.
(http://www.sciencedirect.com/science/article/B6T6T-4R7J61X-1/2/c1812067de837a5ba752b608378d493d)
Abstract:
The purpose of the paper is to identify and describe differences in cognitive structures between consumer segments with differing levels of acceptance of genetically modified (GM) food. Among a sample of 60 mothers three segments are distinguished with respect to purchase intentions for

GM yogurt: non-buyers, maybe-buyers and likely-buyers. A homogeneity test for the elicited laddering data suggests merging maybe- and likely-buyers, yielding two segments termed accepters and rejecters. Still, overlap between the segments' cognitive structures is considerable, in particular with respect to a health focus in the evaluation of perceived consequences and ambivalence in technology assessment. Distinct differences are found in the assessment of benefits offered by GM food and the importance of values driving product evaluation and thus purchase decisions.
Keywords: Means-end chain; Laddering; Values; Risk perception; Benefit perception; Genetically modified foods; Consumer acceptance

Zahid Ayub, Current and future prospects of enhanced heat transfer in ammonia systems, International Journal of Refrigeration, Volume 31, Issue 4, Refrigeration with Ammonia and Hydrocarbons, June 2008, Pages 652-657, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2007.11.012.
(http://www.sciencedirect.com/science/article/B6V4R-4R8WJX8-2/2/6b1f6a23ae3de451a121e80896cf16ad)
Abstract:
In the last decade a moderate headway has been made in the application of enhanced surface heat exchangers in ammonia refrigeration systems. This has been a result of the persistent issue of ozone and global warming which has resulted in keen interest in natural refrigerants such as ammonia that has played a prominent role in the refrigeration industry for years, particularly in the field of food, beverage and marine. The only drawback with ammonia is the toxicity; hence, if smaller heat exchangers could be introduced in order to reduce ammonia charge, this negative aspect about ammonia can be addressed to a great extent. In order to achieve this goal, novel and compact heat exchangers with enhanced surfaces have to be introduced. This paper presents an over view of the status of ammonia as a refrigerant and discusses the present and the future trends in the development of compact heat exchangers for use in ammonia refrigeration.
Keywords: Refrigeration system; Ammonia; Survey; Technology; Heat exchanger; Shell-and-tube exchanger; Plate heat exchanger; Systeme frigorifique; Ammoniac; Enquete; Technologie; Echangeur de chaleur; Echangeur multitubulaire; Echangeur a plaque

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

Charlotte T. Lee, Shripad Tuljapurkar, Population and prehistory I: Food-dependent population growth in constant environments, Theoretical Population Biology, Volume 73, Issue 4, June 2008, Pages 473-482, ISSN 0040-5809, DOI: 10.1016/j.tpb.2008.03.001.
(http://www.sciencedirect.com/science/article/B6WXD-4S2F5HJ-1/2/22eca644df9b051bf9ba3633341fca16)
Abstract:
We present a demographic model that describes the feedbacks between food supply, human mortality and fertility rates, and labor availability in expanding populations, where arable land area is not limiting. This model provides a quantitative framework to describe how environment, technology, and culture interact to influence the fates of preindustrial agricultural populations. We present equilibrium conditions and derive approximations for the equilibrium population growth rate, food availability, and other food-dependent measures of population well-being. We examine how the approximations respond to environmental changes and to human choices, and find that the impact of environmental quality depends upon whether it manifests through agricultural yield or maximum (food-independent) survival rates. Human choices can complement or offset environmental effects: greater labor investments increase both population growth and well-being, and therefore can counteract lower agricultural yield, while fertility control decreases the growth rate but can increase or decrease well-being. Finally we establish equilibrium stability criteria, and argue that the potential for loss of local stability at low population growth rates could have important consequences for populations that suffer significant environmental or demographic shocks.
Keywords: Food limitation; Population dynamics; Dependency; Preindustrial agriculture; Resource transfers; Demographics cycles

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.

B. Vanlauwe, F. Kanampiu, G.D. Odhiambo, H. De Groote, L.J. Wadhams, Z.R. Khan, Integrated management of Striga hermonthica, stemborers, and declining soil fertility in western Kenya, Field Crops Research, Volume 107, Issue 2, 10 May 2008, Pages 102-115, ISSN 0378-4290, DOI: 10.1016/j.fcr.2008.01.002.
(http://www.sciencedirect.com/science/article/B6T6M-4RWHGV2-1/2/f96d6eacc58f2da93d0bb5bc6522bec8)
Abstract:
Striga hermonthica (Delile) Benth., stemborers, and declining soil fertility are serious threats to sustainable food production in the Lake Victoria zone of Kenya. To address these constraints, promising integrated crop management technologies were evaluated, using a multi-locational design in four sub-locations in Siaya and Vihiga district (western Kenya) for six cropping seasons. Technologies evaluated consisted of the traditional maize (Zea mays L.) - bean (Phaseolus vulgaris L.) intercrop, maize - Desmodium (Desmodium uncinatum (Jacq.) DC.) push-pull intercrop, Crotalaria (Crotalaria ochroleuca G. Don) - maize rotation, and soybean (Glycine max (L.) Merr) - maize rotation. Within each of these systems, imazapyr-coated herbicide-resistant maize (IR-maize) and fertilizer were super-imposed as sub-plot factors. The push-pull system was observed to significantly reduce Striga emergence and stemborer damage from the second season onwards. IR-maize reduced and delayed Striga emergence from the first cropping season. Differences in Striga emergence and stemborer damage between the other systems were not significantly different. After five cropping seasons, the Striga seedbank was significantly higher in the maize-bean intercrop system than in the push-pull system under both maize varieties while the rotational systems had intermediate values not different from the day zero values. Under IR-maize, the Striga seedbank was significantly lower than under local maize for all cropping systems. Maize yields varied between seasons, districts, and cropping systems. Yields in the push-pull system were higher than in the maize-bean intercrop after two seasons and in the absence of mid-season drought stress. Both maize and soybean responded significantly to fertilizer application for both districts and for most seasons. The various interventions did not substantially affect various soil fertility-related parameters after five seasons. In the short term, IR-maize integrated in a push-pull system is the most promising option to reduce Striga while the rotational systems may need a longer timeframe to reduce the Striga seedbank. Finally, farmer-led evaluation of the various technologies will determine which of those is really most acceptable under the prevailing farming conditions.
Keywords: Crotalaria ochroleuca; Fertilizer; Glycine max; Imazapyr-coated herbicide-resistant maize; Push-pull intercrop; Striga seedbank

Maria L. Marco, Marjon H.J. Wells-Bennik, Impact of bacterial genomics on determining quality and safety in the dairy production chain, International Dairy Journal, Volume 18, Issue 5,

Netherlands Association for the Advancement of Dairy Science 1908-2008, May 2008, Pages 486-495, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2007.11.017.
(http://www.sciencedirect.com/science/article/B6T7C-4R98K47-2/2/083b9bbdff91472c4c7681b7936857f1)
Abstract:
Genomics is revolutionizing our understanding of biological systems and is providing new opportunities for the dairy industry. Genome sequences are now available for strains of many pathogenic and spoilage bacterial species commonly found in food, including dairy products. This information can be harnessed in the dairy production chain to improve molecular diagnostic methods that are either currently applied (e.g., flow cytometry) or under development (e.g., certain polymerase chain reaction (PCR) applications). Genomics approaches can be implemented for microbial enumeration and identification, control of bacterial growth, and the monitoring of antibiotic-resistant strains. This review examines the current status of genomics methods available to detect, quantify, and examine the activities of pathogens and spoilage bacteria present in dairy environments and provides an outlook for future applications of microbial genomics in milk. Once these technologies are routinely applied in the dairy production chain, our understanding of pathogenic and spoilage bacteria and their effect on the milk environment can be expected to increase dramatically.

M.V. Galmarini, J. Chirife, M.C. Zamora, A. Perez, Determination and correlation of the water activity of unsaturated, supersaturated and saturated trehalose solutions, LWT - Food Science and Technology, Volume 41, Issue 4, May 2008, Pages 628-631, ISSN 0023-6438, DOI: 10.1016/j.lwt.2007.04.007.
(http://www.sciencedirect.com/science/article/B6WMV-4NK4GDP-6/2/8e163423f8df652bea3ae1ab7bc4fbfa)
Abstract:
The water activity (aw) of unsaturated and supersaturated trehalose solutions (and some sucrose solutions) was determined using a dew point hygrometer, and correlated using an equation originally proposed by Norrish [1966. An equation for the activity coefficients and equilibrium relative humidities of water in confectionery syrups. Journal of Food Technology, 1,25] for predicting water activity in binary non-electrolyte solutions. The aw lowering behaviour of trehalose was found to be almost identical to that of sucrose solutions at same concentrations; however, due to the lower solubility of trehalose the aw of their saturated solutions is higher than that of sucrose ones. The aw of saturated trehalose solutions at 20, 25, 30, 35 and 40 [degree sign]C was also determined and found to be between 0.953 and 0.928. These values agreed well with predictions made using aw data for trehalose solutions calculated at the solubility concentration at the various temperatures.
Keywords: Trehalose dihydrate; Water activity; Sucrose; Supersaturated; Solubility

E. Kate Kemsley, Henri S. Tapp, Richard Binns, Robert O. Mackin, Anthony J. Peyton, Feasibility study of NIR diffuse optical tomography on agricultural produce, Postharvest Biology and Technology, Volume 48, Issue 2, May 2008, Pages 223-230, ISSN 0925-5214, DOI: 10.1016/j.postharvbio.2007.10.014.
(http://www.sciencedirect.com/science/article/B6TBJ-4RPVJ1W-1/2/9dcdbd2304aab1a404fd161ca833834e)
Abstract:
It is desirable to monitor the quality of fresh fruit and vegetables since it benefits both producers, by offering a competitive advantage, and consumers, by improving consistency and hence encouraging a more healthy and varied diet. Near-infrared (NIR) spectroscopy is a candidate technology for monitoring agricultural produce quality. Here there has been a recent trend toward transmission-based geometries which interrogates deeper into the sample. NIR tomography is the

natural progression of this, offering the possibility of detecting internal defects. The aim of this study was to evaluate a NIR tomograph built from relatively low-cost components. This comprised a stabilised VIS/NIR broadband source; a diode-array NIR spectrometer and a sample turntable. The angular positions of the detector and turntable could be moved independently of each other using two stepper motors under computer control. An experimental approach was adopted to generate a linear `difference image' reconstruction matrix using 47 mm diameter potato cores, with a nominal length of 65 mm, and a 10 mm diameter black rod acting as an internal absorbing perturbation. The reconstruction matrix was generated for a single wavelength (689 nm) using multiple linear regression and evaluated for the case of two perturbing rods. The reconstructed image was of comparable quality to that typically obtained from other so-called `soft-field' tomographic techniques. Although conducted under highly simplified conditions, the results suggest NIR tomography has potential for monitoring internal defects in agricultural produce.
Keywords: Quality control; Near-infrared; Food; Optical tomography; Difference imaging

Philip Lowe, Jeremy Phillipson, Richard P. Lee, Socio-technical innovation for sustainable food chains: roles for social science, Trends in Food Science & Technology, Volume 19, Issue 5, Towards Sustainable Food Chains: Harnessing the Social and Natural Sciences., May 2008, Pages 226-233, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.11.005.
(http://www.sciencedirect.com/science/article/B6VHY-4R6B2HT-1/2/d7b1a80692dec133b9c4366b1d9a6ef9)
Abstract:
The article discusses the evolution of the contemporary agri-food system, charting the increasing assertion of consumer concerns along the food chain and the resultant opposition to technology-driven models of food production. It sets out a case for closer integration between social and natural science research to reflect more effectively the complexity of contemporary food systems, and to respond to demands for technological options and the basic science behind them to be opened up to public scrutiny and social choice.

David C. Little, Francis J. Murray, Ekram Azim, William Leschen, Kathleen Boyd, Andrew Watterson, James A. Young, Options for producing a warm-water fish in the UK: limits to 'Green Growth'?, Trends in Food Science & Technology, Volume 19, Issue 5, Towards Sustainable Food Chains: Harnessing the Social and Natural Sciences., May 2008, Pages 255-264, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.12.003.
(http://www.sciencedirect.com/science/article/B6VHY-4RDPYNH-1/2/1492881c0b1fda69c38d9dcb7a666738)
Abstract:
This paper explores the prospect of a sustainable production system for tilapia and the research implications involved with assessing the commercial viability of such a system for UK farmers seeking to diversify from their traditional practice. Tilapia is a warm-water fish with firm texture, white flesh and mild taste quite similar to other white fish. Whilst tropical in origin it is thought to be highly suitable for low cost aquaculture in temperate zones with the potential to be a more sustainable source of food with fewer environmental impacts than other options. A brief outline of the market gaps which tilapia might occupy is presented. Drawing on a literature review and findings from technical trials, the paper reviews and compares two production systems - novel activated suspension technology (AST) based on retention of waste and its conversion to bio-floc as a feed within the culture system; and conventional Recirculating Aquaculture Systems (RASs). Their potential and financial viability for scaling up to commercial production and their sustainability benefits are considered. The review concludes that AST is currently uncompetitive with RAS in a UK context although the approach has benefits that might be incorporated in a new generation of mixed systems. Refinement of such systems needs to occur with potential adopters and could be

part of the diversification strategy of mixed farms. Such development might further enhance the ethical values of fish produced in small-scale, modular RAS.

M. Mariscal, P. Bouchon, Comparison between atmospheric and vacuum frying of apple slices, Food Chemistry, Volume 107, Issue 4, 15 April 2008, Pages 1561-1569, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.09.031.
(http://www.sciencedirect.com/science/article/B6T6R-4PPF6FG-3/2/91f3e718b6038deaef51ebcaad11fb56)
Abstract:
Vacuum deep-fat frying is a new technology that can be used to improve quality attributes of fried food because of the low temperatures employed and minimal exposure to oxygen. In this paper atmospheric and vacuum frying of apple slices were compared, in terms of oil uptake, moisture loss and color development. In addition, some apple slices were pre-dried (up to 64% w.b.) before vacuum frying to determine the overall effect. To carry out appropriate comparisons between both technologies equivalent thermal driving forces were used in both processes ([Delta]T = 40, 50, 60 [degree sign]C), keeping a constant difference between the oil temperature and the boiling point of water at the working pressure. Vacuum frying was shown to be a promising technique that can be used to reduce oil content in fried apple slices while preserving the color of the product. Particularly, drying prior to vacuum frying was shown to give the best results. For instance, when using a driving force of [Delta]T = 60 [degree sign]C, pre-dried vacuum fried slices absorbed less than 50% of the oil absorbed by atmospheric fried ones. Interestingly, a strong relationship between water loss and oil content was observed in both technologies, allowing the extension of observations that have been made for atmospheric frying.
Keywords: Vacuum frying; Oil uptake; Apple; Deep-fat frying

Roberto La Rovere, Herman Keulen van, Pierre Hiernaux, Judit Szonyi, Robert A. Schipper, Intensification scenarios in south-western Niger: Implications for revisiting fertilizer policy, Food Policy, Volume 33, Issue 2, April 2008, Pages 156-164, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2007.08.004.
(http://www.sciencedirect.com/science/article/B6VCB-4PVY30S-1/2/50f134c41468e3e8c5303ad72d8637fb)
Abstract:
In semi-arid south-western Niger, external fertilizer inputs are a complement of livestock-mediated nutrient transfers for maintaining soil fertility. This paper discusses scenarios of intensification for different farm household types in an area representative of the wetter parts of semi-arid Sahel. Twenty-five-year projections suggest that soil fertility may not always or irreversibly deteriorate under intensification, and that nitrogen is the main external input required. Owning animals allows some households to achieve food security and maintain soil fertility by capturing and mobilizing soil nutrients. Intensification will bring various benefits to livelihoods, but these will be unevenly distributed. The results of this paper should caution scientists and policy-makers against the often heard warning of inevitable losses in soil fertility in the Sahel associated with intensive technologies, and against extrapolating conclusions attained at specific locations or social groups. Endogenous coping strategies based on using local inputs can also be effective and should be explored in addition to a continued attention for the need for more targeted uses of external inputs.
Keywords: Intensification; Sahel; Niger; Soil fertility; Fertilizer policy; Crop-livestock

Gerald Rimbach, Christine Boesch-Saadatmandi, Jan Frank, Dagmar Fuchs, Uwe Wenzel, Hannelore Daniel, Wendy L. Hall, Peter D. Weinberg, Dietary isoflavones in the prevention of cardiovascular disease - A molecular perspective, Food and Chemical Toxicology, Volume 46, Issue 4, Molecular and Physiological Effects of Bioactive Food Components, April 2008, Pages 1308-1319, ISSN 0278-6915, DOI: 10.1016/j.fct.2007.06.029.

(http://www.sciencedirect.com/science/article/B6T6P-4P40KSN-1/2/cb10a06d7705929460f7cd6651166283)
Abstract:
The Food and Drugs Administration has approved a health claim for soy based on clinical trials and epidemiological data indicating that high soy consumption is associated with a lower risk of coronary artery disease. Soy products contain a group of compounds called isoflavones, with genistein and daidzein being the most abundant. A number of cardioprotective benefits have been attributed to dietary isoflavones including a reduction in LDL cholesterol, an inhibition of pro-inflammatory cytokines, cell adhesion proteins and inducible nitric oxide production, potential reduction in the susceptibility of the LDL particle to oxidation, inhibition of platelet aggregation and an improvement in vascular reactivity. There is increasing interest in the use of nutrigenomic methods to understand the mechanisms by which isoflavones induce these changes, and in the use of nutrigenetics to understand why the effects vary between individuals. Nutrigenomics is a rapidly growing field making use of molecular biology methodologies, such as microarray technology and proteomics, to study how specific nutrients or diets affect gene expression and cellular protein levels. The analysis of differential gene expression and protein levels in endothelial cells, macrophages and smooth muscle cells is critical to elucidating the sequence of events leading to the formation of atherosclerotic lesions, and to understanding the potential anti-atherogenic properties of soy isoflavones. An increasing number of studies demonstrate a significant impact of genetic variation on changes in cardiovascular risk factors in response to dietary intervention. Nutrigenetic effects of this type have recently been reported for dietary isoflavones, and may help to explain some of the disparities in the current literature concerning isoflavones and cardiovascular health.
Keywords: Cardiovascular; Isoflavones; Metabolomics; Nutrigenetics; Nutrigenomics; Proteomics; Transcriptomics

Peter Roupas, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) conference, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Page 139, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.10.001.
(http://www.sciencedirect.com/science/article/B6W6D-4PYYTVB-2/2/6141f2f2cdc5b27d77537a4c62139182)

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

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

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

E.A. Szabo, W.R. Porter, C.L. Sahlin, Outcome based regulations and innovative food processes: An Australian perspective, Innovative Food Science & Emerging Technologies, Volume 9, Issue 2, Food Innovation: Emerging Science, Technologies and Applications (FIESTA) Conference, April 2008, Pages 249-254, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.12.001.
(http://www.sciencedirect.com/science/article/B6W6D-4R8WJXY-1/2/9e0b912cc0e37db37be5f951eb5711e9)
Abstract:
Many influences drive food companies to remain competitive globally by delivering to the consumer food that is safe, healthy and nutritious. Innovative food processes such as high pressure, pulsed electric field, ultrasonics, cool plasma and other emerging technologies are possible mechanisms to provide a company with a market edge. Such processes and the products produced also must comply with food regulations. Indeed, increased scrutiny on conformance, adoption of international standards by national governments, and regulatory reform that shifts the focus from prescriptive measures to an outcome base has manifested in many countries to assist in facilitating global trade while ensuring public safety. In Australia, for example, a cooperative arrangement exists between Australia, New Zealand and the Australian States and mainland Territories to develop and implement uniform food standards with the aim to protect public health and safety. These are embodied in the Australia New Zealand Food Standards Code. The Code is not overly prescriptive; it strives for performance and outcome based regulation. Areas requiring pre-market approval are specifically identified as are the procedures for seeking amendment to the Code. For areas outside of these, the onus is on the industry to produce food that is safe and suitable and on governments to regulate on a risk basis to ensure that the industry has mechanisms in place to produce safe and suitable food. Taken together, this represents a co-regulatory approach based on a partnership between consumers, industry and government to achieve food safety outcomes and at the same time enable the industry to expand, innovate and evolve.Industrial relevance
All food offered for sale in Australia (imported or locally manufactured) must comply with the requirements of the Australia New Zealand Food Standards Code. Current requirements minimise prescriptive measures and have moved toward a preventative, through-chain system focussed on achieving food safety outcomes. In this manuscript we provide an insight into Australia's experience with an outcome based regulatory approach and how this can facilitate the food industry to innovate while ensuring public safety.
Keywords: Food regulation; Innovative processes; Australia

Matt Reed, The rural arena: The diversity of protest in rural England, Journal of Rural Studies, Volume 24, Issue 2, Social Movements and Rural Politics, April 2008, Pages 209-218, ISSN 0743-0167, DOI: 10.1016/j.jrurstud.2007.12.006.
(http://www.sciencedirect.com/science/article/B6VD9-4RPD7CY-2/2/aa21eca5e3e0766aded9dbf8d4df2b15)

Abstract:
In the past 15-20 years, the rural areas of England have been used by a wide diversity of groups as the stage for their protest activities. Some have argued that this is due the rise of a rural social movement; this paper contends that rural areas have become both available and advantageous as the locale of protest through a range of interlocking factors. Firstly, that the rise of the network society has repositioned the societal importance of rural areas. Secondly, that the governance of rural areas has changed, allowing the social stake of rurality to be more widely contested. Thirdly, that opportunities to protest have shifted in favour of rural spaces, in terms of technology and policing. Through a discussion of recent changes in rural England and three case studies, The Land is Ours, Farmers for Action and the Organic Food and Farming Movement, this paper examines these changes and what they mean for the future of rural England.
Keywords: Social movements; Rural protest; Organic movement; England

Ervin Balazs, P. Vidhyasekaran, Editor, Handbook of Molecular Technologies in Crop Disease Management, Haworth Food and Agricultural Products Press, An Imprint of the Haworth Press Inc., New York, (2007) London Oxford, 10 Alice street, Binghamton, NY 13904-1580, USA, Price: $54.95, Paper Back, ISBN 13:-978-1-56022-266-8, Website: www.HaworthPress.com., South African Journal of Botany, Volume 74, Issue 2, April 2008, Pages 353-354, ISSN 0254-6299, DOI: 10.1016/j.sajb.2008.01.006.
(http://www.sciencedirect.com/science/article/B7XN9-4S1BXBH-1/2/4cf09ac3dba72f99a1571dcbadc90234)

R.N. Zuniga, J.M. Aguilera, Aerated food gels: fabrication and potential applications, Trends in Food Science & Technology, Volume 19, Issue 4, April 2008, Pages 176-187, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.11.012.
(http://www.sciencedirect.com/science/article/B6VHY-4RBYFWW-1/2/d46908573ec39b34830cd1c87d4246ee)
Abstract:
Aerated gels contain both bubbles and entrapped water, thus offering ample versatility in product development. Dispersed air (or other gases) provides an additional phase within the gel that may accommodate new textural and functional demands. Many food polymers form gels and their target properties may be enhanced by combining materials (mixed polymer gels) or introducing a finely dispersed fat phase (emulsion gels). Traditional methods to generate bubbles in foods as well as non-conventional technologies (membrane processes, microfluidics, etc.) are revised and their potential applications in producing aerated gels are discussed. Aerated gels may find applications in reducing the caloric density of foods and inducing satiety, as carriers of flavors and nutrients, and in novel gastronomic structures.

Andrew C. Wong, Alison L. Van Eenennaam, Transgenic approaches for the reproductive containment of genetically engineered fish, Aquaculture, Volume 275, Issues 1-4, 31 March 2008, Pages 1-12, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2007.12.026.
(http://www.sciencedirect.com/science/article/B6T4D-4RH94RG-3/2/90a6f14131ed7a33879728591f18bf23)
Abstract:
Aquacultural applications of transgenic technologies have the potential to supply the ever growing demand for food products derived from aquatic resources. However, before any benefits of genetically engineered fish can be realized, methods for the containment of transgenic fish must be developed to help prevent their interbreeding with native populations should they be accidentally released or escape. In this review, the current methods of physical and biological containment in use by aquaculturists for confinement of domestic farmed fish are outlined and discussed with regard to their applicability and effectiveness for the containment of transgenic fish.

New and developing transgenic approaches for the confinement of genetically engineered fish, including transgenic sterilization, disruption of embryonic development, and gonad-specific transgene excision are then discussed in detail. Although some preliminary studies allude to ongoing experiments, there are few peer-reviewed scientific publications that describe the implementation of these techniques. The current dearth of publications demonstrating the success of these technically complex methods, even in model fish species, suggests that difficulties may be prevalent when trying to implement such transgenic containment approaches in vivo. Although these containment approaches are being developed to reduce the risks arising from released or escaped transgenic fish, these 'containment transgenes' must themselves survive regulatory scrutiny. Given the extensive regulatory review process that has been associated with the approval of genetically engineered organisms expressing well-characterized proteins that have historically been present in the food supply and are generally regarded as safe, transgenic containment approaches using novel proteins may face an even longer and more complex regulatory process. Nuclear transfer cloning of cultured somatic cells has been reported for model fish species, and represents a non-transgenic approach for the production of targeted gene knockouts in commercial fish species. Inactivating key reproductive gene(s) such that fertility restoration can only be achieved by the selective administration of exogenous hormones may offer an effective solution for the reproductive containment of transgenic fish. Considering the need for dependable containment of transgenic fish and the technical and regulatory challenges that may be associated with transgenic containment approaches, future developments in gene knockout technology may ultimately result in a more reliable and commercially viable approach to achieve genetic reproductive containment.
Keywords: Transgenic fish; Containment; Reversible sterility; Genetic engineering

U. Gonzales Barron, G. Corkery, B. Barry, F. Butler, K. McDonnell, S. Ward, Assessment of retinal recognition technology as a biometric method for sheep identification, Computers and Electronics in Agriculture, Volume 60, Issue 2, March 2008, Pages 156-166, ISSN 0168-1699, DOI: 10.1016/j.compag.2007.07.010.
(http://www.sciencedirect.com/science/article/B6T5M-4PKX5HM-2/2/43dd1a0f33b8b2689921c56b1cde3611)
Abstract:
In order to assure effective traceability, food-producing animals must be identified by a tamper-proof and durable technique. With the advance in human biometric technologies, the deployment of retinal recognition technology for cattle identification and verification has been prompted. The objective of this study was to assess the accuracy of a commercially available retina biometric technology for sheep identification (i) by determining whether light conditions during retinal image capture (indoors and outdoors with shade) and different operators exerted any significant effect on the matching score of the built-in pattern matching algorithm; and (ii) by evaluating the recognition performance of the biometric system for enrolment of one retinal image per sheep and two retinal images per sheep (bimodal biometric system). Neither the light conditions nor the operators were found to have a statistically significant effect on the matching score values of the built-in algorithm; yet it was clear that the pupillary light reflex phenomenon played a major role in obtaining lower matching score values for retinal images taken outdoors. The recognition errors of the one-retina biometric system were estimated to be 0.25% for false matches and 0.82% for false non-matches. An improved bimodal biometric system, i.e., two retinas, that applies a decision criterion based on a simple OR logical operator and a sum of matching scores, has been proposed in this study in order to reduce both probabilities of false matches and false non-matches to near zero.
Keywords: Sheep; Retina; Identification; Traceability; Biometrics; Multimodal

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

Achim Claus, Reinhold Carle, Andreas Schieber, Acrylamide in cereal products: A review, Journal of Cereal Science, Volume 47, Issue 2, March 2008, Pages 118-133, ISSN 0733-5210, DOI: 10.1016/j.jcs.2007.06.016.
(http://www.sciencedirect.com/science/article/B6WHK-4P59X6X-2/2/bccbf283a8ab129e2dbcea0cbc7d6c99)
Abstract:
The review summarises the results of almost 5 years of academic and industrial research on acrylamide in cereal products. Significant progress in this field has been made during that time, as reflected by the numerous publications on this subject. In addition to studies of their formation, mechanisms and toxicological studies, ways to minimise acrylamide in heat-treated starch-rich foods have been the main focus. Therefore, this review will first give a brief overview of acrylamide formation and toxicology, including its mitigation in potato products, with further focus being on cereal products. In the latter commodities, acrylamide can be limited either by selecting suitable raw materials, e.g. flours produced from varieties low in asparagine and of a low extraction rate, respectively, or by optimisation of the production technology. The latter strategy not only

comprises technological measures such as temperature control and selection of the oven type, but also product formulation and the use of low molecular additives.
Keywords: Acrylamide; Bakery products; Cereal; Technology; Formulation; Additives

D.B. Egli, Soybean yield trends from 1972 to 2003 in mid-western USA, Field Crops Research, Volume 106, Issue 1, 27 February 2008, Pages 53-59, ISSN 0378-4290, DOI: 10.1016/j.fcr.2007.10.014.
(http://www.sciencedirect.com/science/article/B6T6M-4R8M5BC-2/2/25de62a4c9346ed9bf71a2fc6c91d6cd)
Abstract:
The increases in crop yield that played an important role in maintaining adequate food supplies in the past may not continue in the future. Soybean (Glycine max L. Merrill) county yield trends (1972-2003) were examined for evidence of plateaus using data (National Agricultural Statistics Service) for 162 counties (215 data sets) in six production systems [Iowa, Nebraska (irrigated and non-irrigated), Kentucky and Arkansas (irrigated and non-irrigated)] representing a range in yield potential. Average yield (1999-2003) was highest in irrigated production in Nebraska (3403 kg ha-1) and lowest in non-irrigated areas in Arkansas (1482 kg ha-1). Average yield in the highest yielding county in each system was 31-88% higher than the lowest. Linear regression of yield versus time was significant (P = 0.05) in 169 data sets and a linear-plateau model reached convergence (with the intersection point in the mid-1990s) in 35 of these data sets, but it was significantly (P = 0.10) better in only three data sets (<2% of the total). Absolute (kg ha-1 year-1) growth rates were associated with productivity, but relative rates were not with the mean relative rates ranging from 1.0 to 1.3% over the six systems. There was, however, a two- to threefold range in relative rate among counties within systems in Nebraska, Iowa, Kentucky and Arkansas (irrigated). Yield did not change (linear regression not significant, P = 0.05) between 1972 and 2003 in 41 counties in non-irrigated areas of Arkansas and Nebraska and in six Kentucky counties of which four had high levels of double-cropping soybean after wheat (Triticum aestivum L.). I found no convincing evidence that soybean yields are reaching plateaus but the technology responsible for this yield growth was apparently completely ineffective in low-yield, high-stress environments.
Keywords: Glycine max (L.) Merrill; Crop productivity; Yield growth rate; Yield plateaus

Saskia M. van Ruth, Johannes Frasnelli, Leire Carbonell, Volatile flavour retention in food technology and during consumption: Juice and custard examples, Food Chemistry, Volume 106, Issue 4, 4th International Workshop on Water in Foods, 15 February 2008, Pages 1385-1392, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.08.093.
(http://www.sciencedirect.com/science/article/B6T6R-4PNM4FM-1/2/67f5f4dd9e267cce88dc93f92f6718c7)
Abstract:
In this study two aspects of the influence of water on flavour retention were evaluated. The first part of the study was focused on the influence of dehydration and subsequent reconstitution of mandarin juices, which was examined by headspace Proton Transfer Reaction Mass Spectrometry. The different treatments were discriminated by their mass spectra with help of Principal Component Analysis. The second part of the study concerned intranasal volatile flavour retention during food consumption. Volatile flavour concentrations were measured at four intranasal locations in nine subjects during consumption of custard desserts. Differences between the locations indicated various degrees of retention of volatile flavour compounds by the watery mucous in the nasal tract.
Keywords: Aroma; Clemenules; Mandarin juice; Water; PTR-MS

X.C. Meng, C. Stanton, G.F. Fitzgerald, C. Daly, R.P. Ross, Anhydrobiotics: The challenges of drying probiotic cultures, Food Chemistry, Volume 106, Issue 4, 4th International Workshop on Water in Foods, 15 February 2008, Pages 1406-1416, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.04.076.
(http://www.sciencedirect.com/science/article/B6T6R-4P2S96B-5/2/128f766871782ea728043a3d52f4efb6)
Abstract:
There is accumulating clinical data supporting the role of probiotics in human health particularly in benefiting the immune system, strengthening the mucosal barrier and suppressing intestinal infection. Fermented and unfermented dairy products enriched with probiotic bacteria have developed into one of the most successful categories of functional foods. From a functional ingredient perspective, the generation of these live cultures in dried formats is particularly attractive, however, it does present challenges in terms of retaining probiotic functionality during powder manufacture and storage. Both freeze-dying and spray-drying can be used for manufacture of probiotic powders on a large-scale, however, both approaches expose the cultures to extreme environmental conditions. Methods of production of dried probiotic powders should be such that viability is maintained in the dried powders following manufacture, and storage to ensure that an adequate number of bacteria can be delivered in the final product. This review will focus on how this can be achieved through approaches such as optimizing drying technology, and the drying matrix, and by manipulating probiotic bacteria by classical (microbiological) or genetic approaches.
Keywords: Probiotic; Freeze-drying; Spray-drying; Cell survival; Glass transition temperature

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

Beverly J. McCabe-Sellers, Catherine Ann Chenard, Meeting the needs of US dietitians for food composition data, Journal of Food Composition and Analysis, Volume 21, Supplement 1, 30th US National Nutrient Databank Conference, February 2008, Pages S27-S34, ISSN 0889-1575, DOI: 10.1016/j.jfca.2007.07.002.

(http://www.sciencedirect.com/science/article/B6WJH-4P7FSC9-3/2/9303bd6bf6341637cb2dc5cec158cd63)
Abstract:
As the largest group of US food and nutrition experts, registered dietitians (RDs) require food composition data to make practice decisions. Uses for these data vary with the practice area, but RDs experience some common needs: (1) easy access to data, (2) continual updates with new foods and new food components important to human health, (3) simple ways to keep abreast of changes, and (4) a basic understanding of the uses and limitations of the data in various practice areas. These needs are largely being met, but gaps exist and some improvements can be made. Availability of accurate data has improved along with the technology to convert the information into useful formats for planning and evaluating diets, writing educational materials, counseling clients and conducting research. However, RDs in some settings may not have access to the technology needed to use food composition databases. Many undergraduate programs do not include courses or training about how food composition data are generated and tabulated. RDs may not know where to quickly find information or know what data are available. As food composition data continue to expand and technology advances, RDs may benefit from exploring new ways to stay abreast of changes and advocate for what is most needed in their practices. Better methods and more food composition data will support evidence-based and cost-effective dietetic practice.
Keywords: Dietetics; Nutrition assessment; Food; Software; Diet

Matthew J. Albers, Lisa J. Harnack, Lyn M. Steffen, David R. Jacobs, 2006 Marketplace Survey of Trans-Fatty Acid Content of Margarines and Butters, Cookies and Snack Cakes, and Savory Snacks, Journal of the American Dietetic Association, Volume 108, Issue 2, February 2008, Pages 367-370, ISSN 0002-8223, DOI: 10.1016/j.jada.2007.10.045.
(http://www.sciencedirect.com/science/article/B758G-4RPSH9J-11/2/e0fd61adf4f70b63fbaf926d4b4c39a2)
Abstract:
In recent years, newer technologies have been developed to reduce the trans-fat content of fats and oils used in manufacturing food products. To examine the implications of these changes on foods in the marketplace, a survey was conducted to assess current levels of trans and saturated fat in three food categories: margarines and butters; cookies and snack cakes; and savory snacks. A sampling of products from each category was conducted at a Wal-Mart Supercenter in the Minneapolis-St Paul, MN, metropolitan area in July of 2006. All information was obtained from product labels, except price, which was recorded from price listings on product shelving. Most margarines and butters (21 of 29), cookies and snack cakes (34 of 44), and savory snacks (31 of 40) were labeled as containing 0 g trans fat. However, some products contained substantial amounts of trans fat. Most notably, 3 of 40 savory snack products were labeled as containing >=3 g trans fat. Significant inverse correlations were found between product price and the saturated and trans-fat content of margarines (r=-0.45) and savory snacks (r=-0.32). In conclusion, it appears that the food industry has made progress in reducing the trans-fat content in a variety of products. Nonetheless, consumers need to read product labels because the trans-fat content of individual products can vary considerably. Products that are lower in trans and saturated fat tend to cost more, which may be a barrier to their purchase for price-conscious consumers.

Christopher B. Field, J. Elliott Campbell, David B. Lobell, Biomass energy: the scale of the potential resource, Trends in Ecology & Evolution, Volume 23, Issue 2, February 2008, Pages 65-72, ISSN 0169-5347, DOI: 10.1016/j.tree.2007.12.001.
(http://www.sciencedirect.com/science/article/B6VJ1-4RN4H73-1/2/a4184f7a660bb4456f66e8a0d018229f)
Abstract:

Increased production of biomass for energy has the potential to offset substantial use of fossil fuels, but it also has the potential to threaten conservation areas, pollute water resources and decrease food security. The net effect of biomass energy agriculture on climate could be either cooling or warming, depending on the crop, the technology for converting biomass into useable energy, and the difference in carbon stocks and reflectance of solar radiation between the biomass crop and the pre-existing vegetation. The area with the greatest potential for yielding biomass energy that reduces net warming and avoids competition with food production is land that was previously used for agriculture or pasture but that has been abandoned and not converted to forest or urban areas. At the global scale, potential above-ground plant growth on these abandoned lands has an energy content representing ~5% of world primary energy consumption in 2006. The global potential for biomass energy production is large in absolute terms, but it is not enough to replace more than a few percent of current fossil fuel usage. Increasing biomass energy production beyond this level would probably reduce food security and exacerbate forcing of climate change.

Ning SU, Xiang-yuan WAN, Hu-qu ZHAI, Jian-min WAN, Progress and Prospect of Functional Rice Researches, Agricultural Sciences in China, Volume 7, Issue 1, January 2008, Pages 1-9, ISSN 1671-2927, DOI: 10.1016/S1671-2927(08)60016-4.
(http://www.sciencedirect.com/science/article/B82XG-4RXTDD5-1/2/6f8f6cae0bae35e18db000f5f152a508)
Abstract:
With the rapid development of economy and the increase of people's living standards, functional foods are being gradually embraced by consumers and have a great growth potential. Rice is the main staple food in China. It plays an important role in promoting people's health and in improving public nutrition, and therefore there is an ever-increasing consumer demand for rice for its functional quality. This study introduces the concept of functional rice and summarizes the current research progress on this topic and the application of breeding strategies including traditional breeding, induced mutagenesis, molecular marker-assisted selection and transgenic engineering in the research of a new generation of functional rice that posses health benefits, therapeutic values, bioreactor properties, and other unique functions. We then point out the prospect of functional rice from the point of view of social development, germplasm innovation, breeding of functional rice by biological technology and the test of active material related functional rice. We conclude that developing and marketing of functional rice is becoming a subject of great importance for research and is to be the focus of research in future.
Keywords: functional rice; functional rice breeding; research progress

Svetlana Ristovski-Slijepcevic, Gwen E. Chapman, Brenda L. Beagan, Engaging with healthy eating discourse(s): Ways of knowing about food and health in three ethnocultural groups in Canada, Appetite, Volume 50, Issue 1, January 2008, Pages 167-178, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.07.001.
(http://www.sciencedirect.com/science/article/B6WB2-4P718GX-2/2/b72ff11ead86a4ed25fc04ac7bf81494)
Abstract:
The aim of this study was to increase our understanding of how people make sense of healthy eating discourses by exploring the `ways of knowing' about healthy eating among members of three different ethnocultural groups in Canada: African Nova Scotians, Punjabi British Columbians and Canadian-born European Nova Scotians and British Columbians. Data for this paper come from in-depth, individual interviews with 105 adults where they described their experiences, interpretations, and reasoning used in learning and deciding what to believe and/or reject about healthy eating. Between and within ethnocultural group differences in how people come to know and use practices about healthy eating were examined as they were represented through three

broad healthy eating discourses: cultural/traditional, mainstream and complementary/ethical. The discourses represented different ways to interpret the food-health relationship and make sense of the evidence about healthy eating in the everyday experience. Engagement with different discourses led participants to undertake different practices upon themselves in the name of healthy eating. We suggest that each of the discourses has a significant contribution to make in a dialogue about how healthy eating, as part of health and well-being, should be conceptualized by a society.
Keywords: Healthy eating; Culture; Qualitative; Foucault; Discourse; Technologies of the self

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

Ondrej Masek, Miki Konno, Sou Hosokai, Nozomu Sonoyama, Koyo Norinaga, Jun-ichiro Hayashi, A study on pyrolytic gasification of coffee grounds and implications to allothermal gasification, Biomass and Bioenergy, Volume 32, Issue 1, January 2008, Pages 78-89, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2007.07.007.
(http://www.sciencedirect.com/science/article/B6V22-4PF0X7R-3/2/db48ef29933dd9c283a8373ee1485401)
Abstract:
The increasing interest in biomass, as a renewable source of energy, is stimulating a search for suitable biomass resources as well as the development of technologies for their effective utilization. This work concentrated on characteristics of processes occurring during pyrolytic gasification of upgraded food industry residues, namely residue from industrial production of liquid coffee, and assessed its suitability for conversion in an allothermal gasifier. The influence of several operating parameters on product composition was examined with three different laboratory-scale reactors, studying the primary pyrolysis and secondary pyrolysis of nascent volatiles, and the steam gasification of char. The experimental results show that a high degree of conversion of UCG into volatiles and gases (up to 88% C-basis) can be achieved by fast pyrolysis even at temperatures as low as 1073 K. In addition, the degree of conversion is not influenced by the presence or concentration of steam, which is an important factor in allothermal gasification. Mathematical simulation of an allothermal gasifier showed that net cold-gas efficiency as high as 86% can be reached.
Keywords: Pyrolysis; Gasification; Biomass; Residue; Tar; Allothermal; Coffee; Simulation

K.M. Kemp, A.J. Jamieson, P.M. Bagley, M.A. Collins, I.G. Priede, A new technique for periodic bait release at a deep-sea camera platform: First results from the Charlie-Gibbs Fracture Zone, Mid-Atlantic Ridge, Deep Sea Research Part II: Topical Studies in Oceanography, Volume 55, Issues 1-2, Mid-Atlantic Ridge Habitats and Biodiversity, January 2008, Pages 218-228, ISSN 0967-0645, DOI: 10.1016/j.dsr2.2007.09.011.
(http://www.sciencedirect.com/science/article/B6VGC-4RKVHK0-2/2/c1361c9561ed62564f7d5fee0a9eeff9)
Abstract:
Direct time-series observations of deep-sea biological activity are largely restricted to passive observations of benthic epifauna using unbaited time-lapse camera systems. However, highly mobile fauna such as scavenging fish are not generally observed at unbaited instruments. Here, we describe the successful adaptation of existing baited camera technology to incorporate an autonomous periodic bait-release system. This technology enables long-term high-frequency time-series observations of deep-sea scavenging demersal fish and crustaceans to be made for the first time. The periodic bait-release system was deployed to 3664 m in the Charlie-Gibbs Fracture Zone, Mid-Atlantic Ridge, for 38 days and incorporated six individual bait-release events. The arrival/departure pattern of Munidopsis spp. and macrourids at the camera was indicative of successive responses to individual small baits. A mean macrourid population density estimate of 8 fish km-2 was calculated from first-arrival times at successive releases. The arrival pattern and lingering behaviour of zoarcids were comparable to observations at more persistent large food falls. Seventy-four percent of observed zoarcids were <100 mm in total length, and it is suggested that the location of the deployment in the Charlie-Gibbs Fracture Zone may be of importance as a zoarcid breeding site or nursery ground. Small, possibly juvenile, Coryphaenoides armatus were also observed infrequently. The periodic bait-release design has potential for further development.
Keywords: Periodic bait release; Bait; Baited camera; Lander; Deep water; Scavengers

Yasumi Horimoto, J.M. Lakkis, Encapsulation and Controlled Release Technologies in Food Systems , Blackwell Publishing, Oxford, UK (2007) 10 chapters, p. 256, US$184.99, ISBN: 9780813828558., Food Research International, Volume 41, Issue 3, 2008, Pages 325-326, ISSN 0963-9969, DOI: 10.1016/j.foodres.2007.11.008.
(http://www.sciencedirect.com/science/article/B6T6V-4R8NB7X-4/2/14c61a2ed1d42773ef9f58e76922883e)

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

G. Trejo-Tapia, J.B. Balcazar-Aguilar, B. Martinez-Bonfil, G. Salcedo-Morales, M. Jaramillo-Flores, M.L. Arenas-Ocampo, A. Jimenez-Aparicio, Effect of screening and subculture on the production of betaxanthins in Beta vulgaris L. var. `Dark Detroit' callus culture, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 32-36, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.009.
(http://www.sciencedirect.com/science/article/B6W6D-4NR18G0-1/2/7e0b595a8f8f8b5a59213fdf14180d86)
Abstract:
Plant cell culture is an innovative technology to produce a variety of substances including natural dyes. Betaxanthins are considered food-safe nutraceutics pigments because exhibit antiradical and antioxidant activity. An important obstacle for developing large-scale production systems based in plant cells has been the instability of metabolite accumulation. In this work, a protocol was established to obtain yellow callus of B. vulgaris var. `Dark Detroit'. Homogeneous and heterogeneous pigmented callus were obtained with yellow, red, orange and colorless phenotype. Particular attention was done to isolate and establish a yellow line. After continuous screening of the more intense yellow callus it was possible to increase the betaxanthins production 1.8-fold after 48 subcultures. Spectrophotometric and chromatographic analysis of the pigments, confirmed the presence of betaxanthins. HPLC analysis indicated two mainly distinct betaxanthins, vulgaxanthin I and II. B. vulgaris yellow callus line did not loose pigment production ability as a result of long-term subculture.
Keywords: Betaxanthins production; Beta vulgaris; Callus culture; Long-term subculture; The stable B. vulgaris cell culture technology developed could be an alternative process to obtain betaxanthins as nutraceutic pigments.

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

Lino R. Correia, Gauri S. Mittal, Otman A. Basir, Ultrasonic detection of bone fragment in mechanically deboned chicken breasts, Innovative Food Science & Emerging Technologies, Volume 9, Issue 1, January 2008, Pages 109-115, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.06.004.
(http://www.sciencedirect.com/science/article/B6W6D-4P192K3-2/2/fdfaae830581eb37f78ea7c3da350838)
Abstract:
A piston and cylinder apparatus was designed and fabricated based on pulse-echo technique to perform ultrasound scans for both liquids and solid samples of variable heights. A short time fast Fourier transform program was used to reduce noise in the signal. This apparatus was tested with distilled water. Velocity was accurately measured, whereas values of amplitude ratio varied widely. Chicken breast muscles' density, velocity, impedance and amplitude ratio were determined. Amplitude ratio could successfully discriminate between uncut samples, cut samples, and cut samples with a bone fragment, regardless of bone fragment size from 6 mm2 to 16 mm2 projected area. The ratio of amplitude ratios of cut samples with bone fragment to that of cut (or uncut) samples decreased as the ratio of bone fragment projected area to transducer projected area increased.Industrial relevance
New hygiene regulations now require all food industries to implement a documented safety management system based on hazards analysis and critical control point (HACCP) principles. There is a need to detect and remove bone fragments from deboned poultry products before marketing. The technology developed in this research provides a non-invasive cost effective solution to a food safety concern that is causing production bottlenecks and hazardous situations in deboned poultry meat production.
Keywords: Ultrasound; Foreign body detection; Bone fragment; Chicken breast; Food safety

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

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

Veronique COMA, Bioactive packaging technologies for extended shelf life of meat-based products, Meat Science, Volume 78, Issues 1-2, Symposium on Meat safety: From Abattoir to Consumer, January-February 2008, Pages 90-103, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.07.035.
(http://www.sciencedirect.com/science/article/B6T9G-4R46FG4-1/2/f3e0bc89c9a6cc7391e7b548734436c2)
Abstract:
To prevent the development and spread of spoilage and pathogenic microorganisms via meat foodstuffs, antimicrobial packaging materials could be a potential alternative solution. Instead of mixing antimicrobial compounds directly with food, incorporating them in films allows the functional

effect at the food surface - where the microbial growth is mostly found - to be localized. Antimicrobial packagings include systems such as adding a sachet into the package, dispersing bioactive agents in the packaging, coating bioactive agents on the surface of the packaging material, or utilizing antimicrobial macromolecules with film forming properties or edible matrices. The potential of these technologies are evaluated for the preservation of meat and meat products.
Keywords: Antimicrobial packaging; Meat; Active matrices

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

Marnie E. Light, Handbook of Seed Science and Technology, Amarjit S. Basra (Ed.), 2006, Food Products Press(R), An Imprint of The Haworth Press, Inc., 10 Alice Street, Binghamton, NY 13904-1580, Price: US $94.95, Soft Cover, 795 pages, ISBN 1-56022-315-4, Website: www.haworthpress.com., South African Journal of Botany, Volume 74, Issue 1, January 2008, Page 173, ISSN 0254-6299, DOI: 10.1016/j.sajb.2007.11.001.
(http://www.sciencedirect.com/science/article/B7XN9-4RHXYKS-2/2/22481c859898f2fa52c557e0c562ef7b)

Jian-Zhong Han, Yan-Bo Wang, Proteomics: present and future in food science and technology, Trends in Food Science & Technology, Volume 19, Issue 1, January 2008, Pages 26-30, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.07.010.
(http://www.sciencedirect.com/science/article/B6VHY-4PB6VTS-3/2/eebec0e755040e9a45d937100ba863bc)
Abstract:
Post-genomic tools and technologies have dramatically changed the experimental approaches by which complex biological systems can be characterized. The technique of proteome analysis using two-dimensional polyacrylamide gel electrophoresis (2D-PAGE) and mass spectrometry has the power to monitor global changes that occur in the protein complement of tissues and subcellular compartments. A new challenge for proteomics has recently been recognized in the differentiation of food proteomes. This report focuses on the present knowledge and future potential application of proteomics in food science and technology.

Merichel Plaza, Alejandro Cifuentes, Elena Ibanez, In the search of new functional food ingredients from algae, Trends in Food Science & Technology, Volume 19, Issue 1, January 2008, Pages 31-39, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.07.012.
(http://www.sciencedirect.com/science/article/B6VHY-4PB6VTS-2/2/21fdeea07f4e6e16b6e26824712f9092)
Abstract:
The well-known correlation between diet and health demonstrates the great possibilities of food to maintain or even improve our health. This fact has brought about a great interest for seeking new products that can contribute to improve our health and well-being. This type of foods able to promote our health has generically been defined as functional foods. Nowadays, one of the main areas of research in Food Science and Technology is the extraction and characterization of new natural ingredients with biological activity (e.g., antioxidant, antiviral, antihypertensive, etc.) that can contribute to consumer's well-being as part of new functional foods. The present work shows the results of a bibliographic revision done on the chemical composition of different macroalgae together with a critical discussion about their potential as natural sources of new functional ingredients.

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)

Anthony J. Cutaia, Erratum to 'Book Review: Brewing--New Technologies' [Trends Food Sci Technol 18 (2007) 496], Trends in Food Science & Technology, Volume 19, Issue 1, January 2008, Page 54, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.09.001.
(http://www.sciencedirect.com/science/article/B6VHY-4PMJK06-1/2/8ceb6b19fd7ee88d7a10b13cdacf24f9)

A. Kadir, M.A. Wahab, A. Milstein, M.A. Hossain, M.T.I. Seraji, Effects of silver carp and the small indigenous fish mola Amblypharyngodon mola and punti Puntius sophore on fish polyculture production, Aquaculture, Volume 273, Issue 4, 20 December 2007, Pages 520-531, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2007.07.012.
(http://www.sciencedirect.com/science/article/B6T4D-4P8GWV2-1/2/3f82f05b3bb65ae231d1910f74eafd84)
Abstract:
A sustainable semi-intensive pond aquaculture technology including major carp species as cash-crop and small indigenous fish species (SIS) as food for the farmers' families is being optimized in Bangladesh. The inclusion of silver carp (Hypophthalmichthys molitrix), a cheap large species affordable by poor farmers, is now being considered. As part of a study on the effects of this filter feeder on polycultures including the large carps rohu (Labeo rohita), catla (Catla catla) and common carp (Cyprinus carpio) and the SIS punti (Puntius sophore) and mola (Amblypharyngodon mola), an experiment was carried out under farm conditions to test the effects of silver carp and of each SIS species on the growth, survival and yield of the large and small species and on pond ecology.
The experiment was performed in 38 farmers' fishponds of different sizes, from 220 m2 to 1200 m2. The results show that the larger the fish pond the better rohu performance, the larger punti fry weight and the lower punti fry harvested biomass. Pond size did not affect other fish species. The addition of 250 mola and/or punti per 100 m2 fishponds affected rohu and catla and did not affect

common and silver carps. The addition of mola alone reduced rohu's parameters by 15%. The addition of SIS in the three combinations tested (250 mola, 250 punti, 125 of each species) reduced catla's parameters by 20-24%. Punti fry were larger when both SIS were stocked and punti fry biomass was larger when only punti were present. Total mola harvested biomass and yield were larger when the entire SIS stocked were only mola.
The addition of 10 silver carp over the 99 large carps stocked per 100 m2 fishponds negatively affected rohu and catla growth and yield by about 15-21% and 45-50% respectively but not their survival, did not affect common carp performance, did not affect punti and mola reproduction in the ponds, reduced punti yields by 25%, reduced mola performance by about 35%, and silver carp own biomass increased total yield and total income in about 12% each. These effects are explained and discussed considering fish interactions through the food web. The decreased income from selling the more expensive large carps is more than compensated by that obtained from silver carp, which allows the option to the farmer to sell part of the silver carp to complete the cash income that would have been obtained from large carps only if silver carp would not be stocked, and consume the rest with the family.
Keywords: Catla; Food web; Mola; Polyculture; Punti; Rohu; Silver carp; SIS small indigenous species

Edmundo Barrios, Soil biota, ecosystem services and land productivity, Ecological Economics, Volume 64, Issue 2, Special Section - Ecosystem Services and Agriculture - Ecosystem Services and Agriculture, 15 December 2007, Pages 269-285, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2007.03.004.
(http://www.sciencedirect.com/science/article/B6VDY-4NM5XTR-1/2/8d2d4526cdfcb0a44dc1242f08686696)
Abstract:
The soil environment is likely the most complex biological community. Soil organisms are extremely diverse and contribute to a wide range of ecosystem services that are essential to the sustainable function of natural and managed ecosystems. The soil organism community can have direct and indirect impacts on land productivity. Direct impacts are those where specific organisms affect crop yield immediately. Indirect effects include those provided by soil organisms participating in carbon and nutrient cycles, soil structure modification and food web interactions that generate ecosystem services that ultimately affect productivity. Recognizing the great biological and functional diversity in the soil and the complexity of ecological interactions it becomes necessary to focus in this paper on soil biota that have a strong linkage to functions which underpin `soil based' ecosystem services. Selected organisms from different functional groups (i.e. microsymbionts, decomposers, elemental transformers, soil ecosystem engineers, soil-borne pest and diseases, and microregulators) are used to illustrate the linkages of soil biota and ecosystem services essential to life on earth as well as with those associated with the provision of goods and the regulation of ecosystem processes. These services are not only essential to ecosystem function but also a critical resource for the sustainable management of agricultural ecosystems. Research opportunities and gaps related to methodological, experimental and conceptual approaches that may be helpful to address the challenge of linking soil biodiversity and function to the provision of ecosystem services and land productivity are discussed. These include: 1) integration of spatial variability research in soil ecology and a focus on `hot spots' of biological activity, 2) using a selective functional group approach to study soil biota and function, 3) combining new and existing methodological approaches that link selected soil organisms, the temporal and spatial dynamics of their function, and their contribution to the provision of selected `soil based' ecosystem services, 4) using understanding about hierarchical relationships to manage soil biota and function in cropping systems, 5) using local knowledge about plants as indicators of soil quality, remote sensing and GIS technologies, and plant-soil biota interactions to help understand the impacts of soil biota at landscape scale, and 6) developing land quality monitoring systems that inform land users about

their land's ecosystem service performance, improve capacities to predict and adapt to environmental changes, and support policy and decision-making.
Keywords: Agriculture; Ecosystem services; Soil biodiversity; Soil biological processes

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

Matias B. Vanotti, Ariel A. Szogi, Patrick G. Hunt, Patricia D. Millner, Frank J. Humenik, Development of environmentally superior treatment system to replace anaerobic swine lagoons in the USA, Bioresource Technology, Volume 98, Issue 17, December 2007, Pages 3184-3194, ISSN 0960-8524, DOI: 10.1016/j.biortech.2006.07.009.
(http://www.sciencedirect.com/science/article/B6V24-4KPFKGT-5/2/0f167f92ea02e9da3e3d1eb6dbcfa1bb)
Abstract:

A full-scale treatment system for swine manure was developed to eliminate discharge to surface and ground waters and contamination of soil and groundwater by nutrients and heavy metals, along with related release of ammonia, odor, and pathogens. The system greatly increased the efficiency of liquid-solid separation by polymer injection to increase solids flocculation. Nitrogen management to reduce ammonia emissions was accomplished by passing the liquid through a module where bacteria transformed ammonia into harmless nitrogen gas. Subsequent alkaline treatment of the wastewater in a phosphorus module precipitated phosphorus and killed pathogens. Treated wastewater was recycled to clean swine houses and for crop irrigation. The system was tested during one year in a 4400-head finishing farm as part of the Agreement between the Attorney General of North Carolina and swine producers Smithfield Foods, Premium Standard Farms and Frontline Farmers to replace traditional waste treatment anaerobic lagoons with environmentally superior technology. The on-farm system removed 97.6% of the suspended solids, 99.7% of BOD, 98.5% of TKN, 98.7% of soluble ammonia , 95.0% of total P, 98.7% of copper and 99.0% of zinc. It also removed 97.9% of odor compounds in the liquid and reduced pathogen indicators to non-detectable levels. Based on performance obtained, it was determined that the treatment system met the Agreement's technical performance standards that define an environmentally superior technology. These findings overall showed that cleaner alternative technologies are technically and operationally feasible and that they can have significant positive impacts on the environment and the livestock industry.
Keywords: Manure treatment; Pathogen inactivation; Nitrification-denitrification; Phosphorus and ammonia removal; Confined swine production; Piggery

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

L.H.E.S. Laboissiere, R. Deliza, A.M. Barros-Marcellini, A. Rosenthal, L.M.A.Q. Camargo, R.G. Junqueira, Effects of high hydrostatic pressure (HHP) on sensory characteristics of yellow passion fruit juice, Innovative Food Science & Emerging Technologies, Volume 8, Issue 4, High Pressure

Processing Special Issue Section, December 2007, Pages 469-477, ISSN 1466-8564, DOI: 10.1016/j.ifset.2007.04.001.
(http://www.sciencedirect.com/science/article/B6W6D-4NF4F5D-1/2/07fe01e3f245bb4b9b756a99bfac0dac)
Abstract:
The aim of this study was to investigate the effects of high hydrostatic pressure on the sensory properties of passion fruit juice by quantitative descriptive analysis (QDA). The growing demand in Brazil for processed fruit pulp arouses juice industry interest to search for novel technologies with competitive advantages. High hydrostatic pressure (HHP) is an innovative technology which minimizes loss of sensory and nutritional quality, as compared to pasteurization, matching consumer demands for fresh-like foods. QDA and principal components analysis (PCA) results revealed high similarity among juice sensory attributes from in natura and pressurized samples both differing from commercial ones. Results suggest that HHP may be successfully used to preserve yellow passion fruit pulp, yielding a ready to drink juice with improved sensory quality, as compared to commercial juices available in the Brazilian market and evaluated in this study.Industrial relevance
The findings achieved in the study have important implication to the industry, because they demonstrated the positive effect of pressurization on the sensory properties of passion fruit juice. Pressurized juice should meet consumer's expectation and demand regarding a more natural, and free of cooked and artificial flavor attributes, yielding a product more similar to the freshly made one.
Keywords: Yellow passion fruit juice; High hydrostatic pressure; Quantitative descriptive analysis

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

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

U.R. Charrondiere, B. Burlingame, Identifying food components: INFOODS tagnames and other component identification systems, Journal of Food Composition and Analysis, Volume 20, Issue 8, 6th International Food Data Conference, December 2007, Pages 713-716, ISSN 0889-1575, DOI: 10.1016/j.jfca.2007.06.004.
(http://www.sciencedirect.com/science/article/B6WJH-4P2S91M-2/2/a86592f10b6eb65a2ab9f4d44c8e4322)
Abstract:
Food components need to be identified correctly and unambiguously. This is essential in the documentation and interchange of compositional data and it avoids confusion and misinterpretation for the users of these data. For this purpose, INFOODS published the first set of component identifiers, also called tagnames, in 1989. Since then, reported food components have vastly increased in number due to advances in analytical methods and increased interest in bioactive non-nutrient components. Users of food composition data are increasingly interested in more detailed data on fatty acids (e.g. positional and geometric isomers), individual vitamers and the speciation of nutrient elements. Several hundred tagnames have been added to the INFOODS database in the past 15 years. In order to keep up with the plethora of food components being

analyzed and compiled in food composition databases, as well demands from new sectors and user, INFOODS held a technical consultation in 2003 to review and update principles and practices. Recommendations included separating units and base quantities from the definition of a tagname, maintaining the principle of different tagnames for highly empirical methods, and maintaining the keyword approach through which the components can be further defined. The comparison between INFOODS tagnames and other component identification systems such as EUROFOODS shows that the majority of component identifiers are the same. Further discussions and trials are needed to continue the evolution of the harmonized system of component identification through the lenses of both nutrition science and information technology.
Keywords: Component identification; INFOODS tagnames; Food composition; Nutrients; Data interchange; Food data systems

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

Jean A.T. Pennington, Phyllis J. Stumbo, Suzanne P. Murphy, Suzanne W. McNutt, Alison L. Eldridge, Beverly J. McCabe-Sellers, Catherine A. Chenard, Food Composition Data: The Foundation of Dietetic Practice and Research, Journal of the American Dietetic Association, Volume 107, Issue 12, December 2007, Pages 2105-2113, ISSN 0002-8223, DOI: 10.1016/j.jada.2007.09.004.
(http://www.sciencedirect.com/science/article/B758G-4R7N538-K/2/eb1b72fa92f7c9246c63ae114bf42649)
Abstract:
Food composition databases and dietary assessment systems are important tools for food and nutrition professionals. The availability and accessibility of data have improved over time along with the technology to convert the information into useful formats for planning diets, writing educational materials, counseling patients, and conducting research. Primary sources of food composition data include government, academic, and other institutional databases; the food industry; and scientific literature. Changes in the marketplace affect food availability and composition and affect the accuracy and adequacy of food composition databases. Improvements in both food composition data and in dietary assessment methods have worked synergistically to improve estimates of dietary intake. The development of databases for food frequency assessment systems requires special considerations for data aggregation for each food or food grouping in the questionnaires. Considerations for selecting a dietary assessment system include appropriateness of the data for the intended audience or purpose, efficiency of the search strategy for retrieving data, content and format of summary information, and cost. Needs for food composition data vary depending on dietetic practice area; however, most food and nutrition professionals will benefit from becoming more informed about food composition data, exploring new ways to educate themselves about databases and database systems, and advocating for what is most needed in dietetic practice.

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.

Philip John Kanu, Kerui Zhu, Jestina Baby Kanu, Huiming Zhou, Haifeng Qian, Kexue Zhu, RETRACTED: Biologically active components and nutraceuticals in sesame and related products:

a review and prospect, Trends in Food Science & Technology, Volume 18, Issue 12, December 2007, Pages 599-608, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.06.002.
(http://www.sciencedirect.com/science/article/B6VHY-4P40KJ1-1/2/e081e0d1dbee3d348d301c996c231e2c)
Abstract:
This article has been retracted at the request of the Editor-in-Chief. Please see Elsevier Policy on Article Withdrawal (http://www.elsevier.com/locate/withdrawalpolicy).
Reason: It has been drawn to the Editors' attention that this paper contains significant parts copied (without citing the reference) from a previously published paper: Biologically Active Components and Nutraceuticals in Peanuts and Related Products: Review. Joel Isanga and Guo-Nong Zhang, Food Reviews International, 23 (2007) 123-140. As it duplicated previously published material, we must retract the paper published in Trends in Food Science & Technology.

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

M. Polo-Cerda, A. Romero, J. Casabo, J. De Juan, The Bronze Age burials from Cova Dels Blaus (Vall d'Uixo, Castello, Spain): An approach to palaeodietary reconstruction through dental pathology, occlusal wear and buccal microwear patterns, HOMO - Journal of Comparative Human Biology, Volume 58, Issue 4, 9 November 2007, Pages 297-307, ISSN 0018-442X, DOI: 10.1016/j.jchb.2006.10.005.
(http://www.sciencedirect.com/science/article/B7GW4-4PC4FGM-1/2/256e84b4b5017169510fbc5c678ddbc7)
Abstract:
This paper reports a palaeodietary investigation of the human remains found in the collective Bronze Age burial cave from Vall d'Uixo (Castello, Spain). Dental pathology, tooth wear as well as buccal dental microwear were analysed. Percentages of dental pathologies were compared with Chalcolithic and Bronze Age sites from the same territory. Dental caries, ante-mortem tooth loss, periodontal disease and abscess frequencies indicate a diet rich in carbohydrate foods. However, dental calculus percentages and macroscopic wear patterns suggest a diet not exclusively relying on agricultural resources. In addition, buccal dental microwear density and length by orientation recorded on micrographs using a scanning electron microscope showed inter-group differences with regard to carnivorous hunter-gatherers and farming populations related to the amount of abrasives in the diet that could correspond to a different dependence on agricultural resources or food preparation technology.

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

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

Deborah D. Marino, Water and Food Safety in the Developing World: Global Implications for Health and Nutrition of Infants and Young Children, Journal of the American Dietetic Association, Volume 107, Issue 11, November 2007, Pages 1930-1934, ISSN 0002-8223, DOI: 10.1016/j.jada.2007.08.013.
(http://www.sciencedirect.com/science/article/B758G-4R02VG4-D/2/1a6a1cad802ce248687df47a8d8310d6)
Abstract:
Contaminated water and food are major causes of malnutrition and mortality in the developing world, particularly among children. Infants are most vulnerable to diarrheal illnesses when introduced to fluids and foods as they are weaned from breastfeeding to a mixed diet. There is scant literature about the role of nutrition professionals in addressing this problem. Considerable progress has been made in identifying strategies to prevent diarrhea in children. Strategies include implementing low-technology methods of sanitizing water, emphasizing the benefits of breastfeeding, protecting prepared foods from unclean environments, and educating and motivating food preparers. Resolution of water and food safety problems requires a collaborative interdisciplinary approach among health professionals and involvement of community leaders. Dietetic professionals have the training to empower individuals and communities with skills to create a safe water and food environment.

Rolf Meyer, Comparison of scenarios on futures of European food chains, Trends in Food Science & Technology, Volume 18, Issue 11, November 2007, Pages 540-545, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.02.008.
(http://www.sciencedirect.com/science/article/B6VHY-4N85B2X-1/2/2a6a2829e039491a3b5b43b90a9c5065)
Abstract:

The paper compares recent scenarios on the European food and agriculture sector, based on the own scenario writing in the frame of the project 'Trends in food supply and demand and their consequences' of the Office of Technology Assessment at the German Parliament. The aim is to work out common points and differing assumptions so that a better understanding of possible futures for European food chains can be achieved.
Scenarios from technology assessment, foresight and sustainability research activities in different European countries are included. They focus in different ways on technological developments, production systems, policy arrangements and/or societal changes. Furthermore, the food chain is not mapped always adequately, which means the main focus is partly on agriculture. The driving forces for the scenarios are more or less differentiated, with interesting analogies. Finally, nearly all compared scenario papers work with a qualitative approach and have a medium-term time horizon.
Lessons from the comparison are that the open future of European food chains depends in great parts from uncertainties in three areas:
- technological uncertainties,
- societal uncertainties, and
- political uncertainties.
At least for the European food sector, the important influence of societal values and developments cannot be denied. The analysed scenario studies give a first insight which impacts on the food chain can result from future societal developments. For the political uncertainties, different paths are seen for the future shaping of the Common Agricultural Policy - varying from liberalisation to enforced regionalisation. At the same time, this indicates that a comprehensive policy for the food chain is still missing and it is uncertain if such a policy can be achieved.
The three areas of uncertainties are also key elements to examine the realisation problems of sustainability strategies. More investigation is needed to understand better the influence of technological, societal and political framework conditions on sustainability strategies for the food and agriculture sector, to analyse conflicts between different sustainability goals, and to identify possible options for action which are robust under different and also unfavourable conditions.

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

David F. Kendra, Rex B. Dyer, Opportunities for biotechnology and policy regarding mycotoxin issues in international trade, International Journal of Food Microbiology, Volume 119, Issues 1-2, Mycotoxins from the Field to the Table, 20 October 2007, Pages 147-151, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.036.
(http://www.sciencedirect.com/science/article/B6T7K-4P9SN8X-G/2/a43dfc480a1079540cf2b93196db760a)
Abstract:
Despite being introduced more than a decade ago, agricultural biotechnology still remains framed in controversy impacting both the global economy and international regulations. Controversies surrounding agricultural biotechnology produced crops and foods commonly focus on human and environmental safety, intellectual property rights, consumer choice, ethics, food security, poverty reduction and environmental conservation. Originally, some consumers were reluctant to accept the first generation agricultural biotechnology products because they appeared to primarily benefit agricultural producers; however, it is clear from continued evaluations that these technologies also improved both the safety and wholesomeness of food and helped improve the environment. Plants engineered to resist insect pests and tolerate less toxic pesticides resulted in improved yields thereby enabling farmers to produce more food per acre while reducing the need for herbicides, pesticides, and water and tilling. An indirect benefit of reduced pest damage in transgenic corn expressing genes to control insect pests is lower levels of mycotoxins, most notably those caused by the genus Fusarium. Mycotoxins are an important regulatory issue globally because of their toxic and carcinogenic potential to humans and animals. Complicating this issue is the fact that toxicological databases for mycotoxins are relatively incomplete compared to other food contaminants. Current debates about agricultural biotechnology and mycotoxins reveal significant differences in perception of associated risks and benefits. When faced with uncertainty, regulators tend to set limits as low as possible. Additionally, some regulators invoke the 'Precautionary Principle' when limited information is available or disputes over interpretation exist for possible contaminants, including mycotoxins. A major concern regarding use of the 'Precautionary Principle' is the appearance that regulators can justify setting any limit on the basis of inconclusive or unknown potential hazards of a contaminant which may significantly impact global trade because mycotoxin residues vary widely between countries. This paper describes the current economic and heath impact of these regulations and their impact on international trade.
Keywords: Agricultural biotechnology; Aflatoxin; Deoxynivalenol; Fumonisin; Mycotoxins; Precautionary Principle

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

M.S. Swaminathan, Can science and technology feed the world in 2025?, Field Crops Research, Volume 104, Issues 1-3, `Ground-breaking Stuff'- Proceedings of the 13th Australian Society of Agronomy Conference, 10-14 September 2006, Perth, Western Australia, October-December 2007, Pages 3-9, ISSN 0378-4290, DOI: 10.1016/j.fcr.2007.02.004.
(http://www.sciencedirect.com/science/article/B6T6M-4PC90J6-2/2/9bfd2365bcd93233bce5728924bba8b3)
Abstract:
By 2025 the global population will exceed 7 billion. In the interim per capita availability of arable land and irrigation water will go down from year to year while biotic and abiotic stresses expand. Food security, best defined as economic, physical and social access to a balanced diet and safe drinking water will be threatened, with a holistic approach to nutritional and non-nutritional factors needed to achieve success in the eradication of hunger. Science and technology can play a very important role in stimulating and sustaining an Evergreen Revolution leading to long-term increases in productivity without associated ecological harm.
Keywords: Green revolution; Evergreen Revolution; Village knowledge centers; Sustainable solutions; Rural-urban parity index

Snin-ichiro Kobayashi, Alimuddin, Tetsuro Morita, Misako Miwa, Jun Lu, Masato Endo, Toshio Takeuchi, Goro Yoshizaki, Transgenic Nile tilapia (Oreochromis niloticus) over-expressing growth hormone show reduced ammonia excretion, Aquaculture, Volume 270, Issues 1-4, 28 September 2007, Pages 427-435, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2007.05.016.
(http://www.sciencedirect.com/science/article/B6T4D-4NTBFG6-1/2/ef9939b4fe5fb909f08617b2474f1322)
Abstract:
The growth of aquaculture has negatively affected the environment due to the high levels of nitrogen excreted by farmed fish. Here we propose that modifying the nitrogen metabolism of the fish themselves using transgenic technology might solve the pollution problem. Growth hormone (GH) is known to increase protein retention and absorption, and is thought to reduce ammonia excretion. Thus, we produced transgenic Nile tilapia (Oreochromis niloticus) that over-expressed the GH gene throughout their bodies. Our findings showed that the food-conversion efficiency of the transgenic fish was 35% higher than that of their non-transgenic siblings. The rearing period required for the transgenic fish to reach a body weight of 20 g was about 75% of that required for non-transgenic fish that were fed the same type and quantity of food. The total amount of ammonium-nitrogen excreted by the transgenic fish was about 69% of that excreted by the wild-type fish over their lifetime. These results suggest that our transgenic approach has the potential to reduce the amount of nitrogen pollution caused by farmed fish. This strategy is a promising option for making aquaculture more `eco-friendly'.
Keywords: Growth hormone; Nitrogen; Pollution; Tilapia; Transgenic

Niels Skovgaard, Food irradiation research and technology, International Journal of Food Microbiology, Volume 118, Issue 2, 15 September 2007, Page 228, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.07.012.
(http://www.sciencedirect.com/science/article/B6T7K-4P961W2-2/2/90f7ed10c786f808b8afb66667a34c9e)

G. Amagliani, C. Giammarini, E. Omiccioli, G. Brandi, M. Magnani, Detection of Listeria monocytogenes using a commercial PCR kit and different DNA extraction methods, Food Control, Volume 18, Issue 9, September 2007, Pages 1137-1142, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.06.012.
(http://www.sciencedirect.com/science/article/B6T6S-4KW5WB6-4/2/3e5b904d3d577f25f2c48b9d88213998)
Abstract:
The aim of our work was to evaluate a new commercial test kit for the detection of Listeria monocytogenes by PCR, using different DNA extraction methods. Food samples (pork sausage and 'mozzarella' cheese) were spiked with known concentrations of L. monocytogenes and culture-enriched for 24 h. DNA extracted using three commercial kits and two standard methods, was amplified in species-specific PCR employing a L. monocytogenes PCR Detection Kit (Diatheva). The PCR-based method proved to be a reliable means of detecting the pathogen in food samples independently from the extraction procedure used, even for a contamination cell number of 1 cfu/g before culture enrichment. The molecular assay, showing perfect agreement with standard microbiological tests and a considerably shortened analysis time, provides a sensitive and rapid alternative for applications in the testing of foods for microbiological contamination, and highlights the potential of PCR technology in routine food control.
Keywords: Listeria monocytogenes; PCR detection kit; Magnetic DNA extraction

A. Gunterus, L.V. Roze, R. Beaudry, J.E. Linz, Ethylene inhibits aflatoxin biosynthesis in Aspergillus parasiticus grown on peanuts, Food Microbiology, Volume 24, Issue 6, September 2007, Pages 658-663, ISSN 0740-0020, DOI: 10.1016/j.fm.2006.12.006.
(http://www.sciencedirect.com/science/article/B6WFP-4MT5JYY-2/2/8aa1986edc4bc44b044a394603402f22)
Abstract:
The filamentous fungi Aspergillus parasiticus and Aspergillus flavus synthesize aflatoxins when they grow on a variety of susceptible food and feed crops. These mycotoxins are among the most carcinogenic naturally occurring compounds known and they pose significant health risks to humans and animals. We previously demonstrated that ethylene and CO2 act alone and together to reduce aflatoxin synthesis by A. parasiticus grown on laboratory media. To demonstrate the potential efficacy of treatment of stored seeds and grains with these gases, we tested ethylene and CO2 for ability to inhibit aflatoxin accumulation on Georgia Green peanuts stored for up to 5 days. We demonstrated an inverse relationship between A. parasiticus spore inoculum size and the level of toxin accumulation. We showed that ethylene inhibits aflatoxin synthesis in a dose-dependent manner on peanuts; CO2 also inhibits aflatoxin synthesis over a narrow dose range. Treatments had no discernable effect on mold growth. These observations support further exploration of this technology to reduce aflatoxin contamination of susceptible crops in the field and during storage.
Keywords: Aflatoxin; Peanuts; Ethylene; Carbon dioxide

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

Patricia J.M. Reis, F. Xavier Malcata, Improvements in small scale artisanal cheesemaking via a novel mechanized apparatus, Journal of Food Engineering, Volume 82, Issue 1, September 2007, Pages 11-16, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.11.032.
(http://www.sciencedirect.com/science/article/B6T8J-4MMPNCW-4/2/f5311c272b4cfe0bea5ffa076861e025)
Abstract:
The current research effort consisted on design, building and testing of a customized apparatus - a closed cylindrical, double-jacketed cheese vat, with a 50 L-capacity, aimed at manufacturing Serra da Estrela cheese (or similar ewe's milk cheeses), provided with knives that play a double role - stirring and cutting, a combined device for draining and pre-moulding, and a cleaning-in-place system. This novel apparatus makes it possible to semi-automate cheesemaking in small scale - including a continuous cycle of hands-free sequential coagulation, cutting, syneresis and moulding of cheeses. It was successfully applied to ewe's milk cheese manufacture, and was able to reduce duration of the overall cycle - with concomitant standardization of the process, and a significant ($P < 0.05$) increase in cheese yield and fat recovery.
Keywords: Dairy foods; Technology; Traditional cheese; Ewe's milk; Yield; Innovation

D. Chiou, T.A.G. Langrish, Development and characterisation of novel nutraceuticals with spray drying technology, Journal of Food Engineering, Volume 82, Issue 1, September 2007, Pages 84-91, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.01.021.
(http://www.sciencedirect.com/science/article/B6T8J-4N0X5J3-5/2/4210ed3fb573c6db5466f2843fe50ee2)
Abstract:
The introduction of natural fruit fibres as an encapsulating agent has demonstrated encouraging results as a replacement carrier for spray drying sticky materials. The combination of these fruit fibres and bioactives (Hibiscus sabdariffa L.) has created a novel nutraceutical product suitable for a variety of applications in functional food manufacturing. Through characterisation of the product, it appears that the material is appropriate in terms of its moisture content and encapsulation of the bioactive material. It also maintains a free-flowing form under appropriately controlled humidity conditions suitable for manufacturing purposes. The presence of the bioactive material in the fibres does not appear to affect the product size or shape significantly. An unusual moisture change phenomenon was observed during exposure of the spray-dried powder to ambient air. A rapid moisture sorption and gradual slow desorption pattern was seen and is believed to be associated with crystallisation behaviour.

Keywords: Amorphous; Bioactive; Crystallisation; Encapsulation; Fruit fibre; Spray drying

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

T.A. McMeekin, Predictive microbiology: Quantitative science delivering quantifiable benefits to the meat industry and other food industries, Meat Science, Volume 77, Issue 1, 53rd International Congress of Meat Science and Technology (53rd ICoMST), September 2007, Pages 17-27, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.04.005.
(http://www.sciencedirect.com/science/article/B6T9G-4NGRRYN-C/2/5db95a00815bdb39997476a7bdb9f644)
Abstract:
Predictive microbiology is considered in the context of the conference theme 'chance, innovation and challenge', together with the impact of quantitative approaches on food microbiology, generally. The contents of four prominent texts on predictive microbiology are analysed and the major contributions of two meat microbiologists, Drs. T.A. Roberts and C.O. Gill, to the early development of predictive microbiology are highlighted. These provide a segue into R&D trends in predictive microbiology, including the Refrigeration Index, an example of science-based, outcome-focussed food safety regulation.
Rapid advances in technologies and systems for application of predictive models are indicated and measures to judge the impact of predictive microbiology are suggested in terms of research outputs and outcomes. The penultimate section considers the future of predictive microbiology and advances that will become possible when data on population responses are combined with data derived from physiological and molecular studies in a systems biology approach.

Whilst the emphasis is on science and technology for food safety management, it is suggested that decreases in foodborne illness will also arise from minimising human error by changing the food safety culture.
Keywords: Predictive microbiology; Quantitative microbial ecology; Current R&D trends; Applications; Advances in technology; Human error and the food safety culture

C.E. Rexroad Jr., R.D. Green, R.J. Wall, Regulation of animal biotechnology: Research needs, Theriogenology, Volume 68, Supplement 1, Proceedings of the International Conference on Farm Animal Reproduction - "From Egg to Embryo", International Conference on Farm Animal Reproduction, 1 September 2007, Pages S3-S8, ISSN 0093-691X, DOI: 10.1016/j.theriogenology.2007.03.017.
(http://www.sciencedirect.com/science/article/B6TCM-4P00RWB-1/2/e2a42810078a2f234cf9d73b6048a209)
Abstract:
Livestock that result from biotechnology have been a part of agricultural science for over 30 years but have not entered the market place as food or fiber. Two biotechnologies are at the forefront as challenges to the world's systems for regulating the market place: animal clones and transgenic animals. Both technologies have come before the Food and Drug Administration in the United States and it appears that action is imminent for clones. The FDA has asserted principles for evaluation of clones and asserts that '... remaining hazard(s) from cloning are likely to be subtle in nature.' The science-based principles recognize that in some areas related to developmental biology and gene expression in clones, additional scientific information would be useful. The role of science then is to use the genomic tools that we have available to answer questions about epigenetic regulation of development and reprogramming of genes to the state found in germ cells. Transgenics pose additional challenges to regulators. If the transgenics are produced using cloning from modified cells then the additional scientific information needed will be related to the effects of insertion and expression of the transgenes. Other approaches such as retrovirally vectored transgenesis will elicit additional questions. These questions will be challenging because the science will have to be related to the expression and function of each gene or class of genes. For the promises of animal biotechnology to be fulfilled, scientists will have to resolve many questions for regulators and the public but tools to answer those questions are rapidly becoming available.
Keywords: Animals; Biotechnology; Regulation; Livestock; Clones; Transgenic; Genetics

Jens Obro, Iben Sorensen, Isabel Moller, Michael Skjot, Jorn Dalgaard Mikkelsen, William G.T. Willats, High-throughput microarray analysis of pectic polymers by enzymatic epitope deletion, Carbohydrate Polymers, Volume 70, Issue 1, 2 August 2007, Pages 77-81, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2007.03.008.
(http://www.sciencedirect.com/science/article/B6TFD-4NBBYSN-1/2/ee9b0e429756b4b6c32224e42f37ba87)
Abstract:
Pectic polysaccharides are abundant plant cell wall glycan polymers and are also widely used as functional food ingredients. The fine structure of pectins, and especially the degree and pattern of methyl-esterification of the homogalacturonan (HG) backbone, play a major part in determining functional properties. We have developed a high-throughput method of analysing pectic polymers by combining microarray-technology, pectin lyase (PL) and anti-HG monoclonal antibodies (mAbs). The technique demonstrates that pectins immobilised in a microarray format are effective substrates for PL, and that epitope loss or degradation can be tracked by the deletion of mAb binding.
Keywords: Pectin; Microarrays; Antibodies

G. Missous, B. Thammavongs, V. Dieuleveux, M. Gueguen, J.M. Panoff, Improvement of the cryopreservation of the fungal starter Geotrichum candidum by artificial nucleation and temperature downshift control, Cryobiology, Volume 55, Issue 1, August 2007, Pages 66-71, ISSN 0011-2240, DOI: 10.1016/j.cryobiol.2007.05.004.
(http://www.sciencedirect.com/science/article/B6WD5-4NXHCDP-1/2/bf044ffa904c195ee30b5250b2947c54)
Abstract:
Food industry tends towards the use of controlled microorganisms in order to improve its technologies including frozen starter production. The fungus Geotrichum candidum, which is currently found in various environments, is widely used as ripening agent in some specific cheese making process. In order to optimize the cryopreservation of this microorganism, freezing experiments were carried out using a Peltier cooler-heater incubator, which permits to control the temperature downshift from +20 to -10 [degree sign]C in time period ranges from 20 to 40 min depending on the experiments. Concomitantly, study of the effect of an industrial ice nucleator protein derived from Pseudomonas syringae (SNOMAX(R)) on the dynamic of freezing of G. candidum was carried out. Our results showed that the addition of this protein in the microbiological suspension has different complementary effects: (i) the synchronization of the different samples nucleation, leading to an homogeneous and earlier freezing, (ii) the increase of the freezing point temperature from -8.6 to -2.6 [degree sign]C, (iii) a significant decrease of the lethality of G. candidum cells subjected to a freezing-thawing cycles challenge.
Keywords: Geotrichum candidum; Starter; Freezing; Nucleation; Stress; Cryopreservation

Ana Ortola-Vidal, Helge Schnerr, Maria Rojmyr, Frida Lysholm, Angus Knight, Quantitative identification of plant genera in food products using PCR and Pyrosequencing(R) technology, Food Control, Volume 18, Issue 8, August 2007, Pages 921-927, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.04.013.
(http://www.sciencedirect.com/science/article/B6T6S-4KJ0SM0-1/2/76e929c181a90ddc6e2a5842020b6fc4)
Abstract:
The ability to extract, amplify, identify and quantify fruit DNA from commercially available jams and yogurts was investigated. Efficient methods for extracting DNA from jams and yogurts were developed based on a modified CTAB protocol. DNA sequence alignment of plant chloroplast rbcL sequences allowed the development of a 104 bp PCR reaction capable of characterising plant genera present in fruit products using DNA amplification and direct sequencing to reveal single nucleotide polymorphisms (SNPs). The rbcL single nucleotide polymorphism approach was made quantitative by combining PCR analysis with Pyrosequencing(R) technology. This enabled the detection of rhubarb yogurt in raspberry yogurt with a detection limit of 2% w/w based on the use of commercially available samples. The method represents a new quantitative approach for determining the identity of plant genera in products.
Keywords: Pyrosequencing(R); PCR; rbcL; Plant identification

J. David Reece, Ejnavarzala Haribabu, Genes to feed the world: The weakest link?, Food Policy, Volume 32, Issue 4, August 2007, Pages 459-479, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2006.10.003.
(http://www.sciencedirect.com/science/article/B6VCB-4MHPC19-1/2/4611a0c2284439bee3b1b69efee053af)
Abstract:
The new science of genomics has an important contribution to make to the development of agriculture in the `Third World' and thus to improving the livelihoods of many of the poorest people on earth. The persistence of poverty demonstrates, however, that this contribution is not yet being made. We therefore examine the web of connections between the two and enquire whether they

could be strengthened in some way, perhaps by the addition of some vital `missing link', so that the contribution from genomics can be maximised. Since the use of molecular markers to help develop improved crop varieties (marker-assisted selection) constitutes one of the main ways in which genomic knowledge could be used to improve rural livelihoods, we review this technology and discuss the ways in which it could contribute to plant breeding. We argue that marker-assisted selection (MAS) is likely to be most effective when it is both (i) linked to the farmers who are expected to cultivate the new crop varieties that will eventually be developed; and (ii) integrated with plant breeding and with a range of complementary disciplines. Such integration necessarily involves the formation of effective trans-disciplinary teams, an undertaking that is often problematic, and so the final part of this article considers the processes that this involves and suggests ways in which they may be managed effectively.
Keywords: Crop biotechnology; Capacity building; Food security; Genomics; Marker-assisted selection; Innovation management

Shuryo Nakai, C.H. Sommers and X. Fan, Editors, Food Irradiation Research and Technology, Blackwell Publishing (2006) ISBN 0813808820, p. 336 [pound sign]95.00., Food Research International, Volume 40, Issue 7, August 2007, Pages 947-948, ISSN 0963-9969, DOI: 10.1016/j.foodres.2007.04.003.
(http://www.sciencedirect.com/science/article/B6T6V-4NJ7W7S-2/2/9ece6ee3dadb4507c95f13ec2614c566)

Gurdeep Rastogi, Mahesh S. Dharne, Sandeep Walujkar, Ashutosh Kumar, Milind S. Patole, Yogesh S. Shouche, Species identification and authentication of tissues of animal origin using mitochondrial and nuclear markers, Meat Science, Volume 76, Issue 4, August 2007, Pages 666-674, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2007.02.006.
(http://www.sciencedirect.com/science/article/B6T9G-4N3WYRT-2/2/69277890d0deeb98f9041d59befe7dd4)
Abstract:
We evaluated and compared the utility of mitochondrial markers viz. 16S rDNA and NADH dehydrogenase subunit 4 (ND4) and a nuclear marker viz. the actin gene to identify the specimens of animal origin for forensic identification, food regulatory control and to prevent illegal trading, poaching and conservation of endangered species. We also tested PCR fingerprinting methods like RAPD and actin barcoding to generate species-specific 'fingerprints'. Our results suggested that mitochondrial markers are more efficient than nuclear markers for the purpose of species identification and authentication. Among PCR fingerprinting approaches, RAPD was proved to be more discriminatory, accurate and efficient than actin fingerprinting. Considering the present scenario in trading of vertebrate animal tissues like buffalo, cow, pig, goat, chicken, frogs, fishes and snakes etc., mitogenomics based technology proved to be efficient and reliable in resolving problems like meat adulteration and smuggling across countries.
Keywords: Mitochondrial markers; Nuclear marker; 16S rDNA; ND4; RAPD; Meat

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)

A. Ronteltap, J.C.M. van Trijp, R.J. Renes, L.J. Frewer, Consumer acceptance of technology-based food innovations: Lessons for the future of nutrigenomics, Appetite, Volume 49, Issue 1, July 2007, Pages 1-17, ISSN 0195-6663, DOI: 10.1016/j.appet.2007.02.002.

(http://www.sciencedirect.com/science/article/B6WB2-4N49VD4-1/2/4729bfd80cd2e8107dd4371f388fdaad)
Abstract:
Determinants of consumer adoption of innovations have been studied from different angles and from the perspectives of various disciplines. In the food area, the literature is dominated by a focus on consumer concern. This paper reviews previous research into acceptance of technology-based innovation from both inside and outside the food domain, extracts key learnings from this literature and integrates them into a new conceptual framework for consumer acceptance of technology-based food innovations. The framework distinguishes `distal' and `proximal' determinants of acceptance. Distal factors (characteristics of the innovation, the consumer and the social system) influence consumers' intention to accept an innovation through proximal factors (perceived cost/benefit considerations, perceptions of risk and uncertainty, social norm and perceived behavioural control). The framework's application as a tool to anticipate consumer reaction to future innovations is illustrated for an actual technology-based innovation in food science, nutrigenomics (the interaction between nutrition and human genetics).
Keywords: Food; Innovation; Technology; Adoption; Consumer acceptance; Nutrigenomics

D.N. Cox, G. Evans, H.J. Lease, The influence of information and beliefs about technology on the acceptance of novel food technologies: A conjoint study of farmed prawn concepts, Food Quality and Preference, Volume 18, Issue 5, July 2007, Pages 813-823, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2007.01.011.
(http://www.sciencedirect.com/science/article/B6T6T-4N2D2S3-2/2/94bdfaf0d086d855f2586b09ab655c56)
Abstract:
Consumers appear to be cautious about accepting novel technologies applied to foods because of perceived risks and lack of benefits. Text descriptions of novel technologies were tested at four locations around Australia on 453 prawn consumers. Half of the participants (Information treatment group) received additional information about the technologies. A conjoint study was undertaken with additional responses to questions on perceived risks, benefits, need, unnaturalness and safety of the technologies (beliefs). Recognition of the additional information was tested by an open question at the end of the task.
Information treatment did not influence responses. Participants were segmented by the sum of their beliefs. Those (mostly male), classified with strong positive beliefs (15%), placed on average, less importance upon technology but an equal amount on cost and size of the product concepts. For those (mostly female), classified with strong negative beliefs (17%), technology was of greater average importance, with a greater range of (dis)utilities across the technologies. All participants favoured regular prawns to those treated with novel technologies although one technology (Triploidy) did receive relatively positive utilities possibly related to information that triploidy is sometimes 'found in nature' and results in larger prawns. Generally, addressing 'information deficit' did not overcome aversion to novel technologies applied to food concepts.
Keywords: Novel; Irradiation; Triploidy; Electron beam; Acceptance; Prawns; Environment; Risk

A. Regattieri, M. Gamberi, R. Manzini, Traceability of food products: General framework and experimental evidence, Journal of Food Engineering, Volume 81, Issue 2, July 2007, Pages 347-356, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.10.032.
(http://www.sciencedirect.com/science/article/B6T8J-4MS9JJM-2/2/89456d3f14bd9620168c3ac2a2d9ce24)
Abstract:
Traceability is becoming a method of providing safer food supplies and of connecting producers and consumers. Recent diseases such as bovine spongiform encephalitis (BSE) and the questions concerning genetically modified organism (GMO) mean systems that enable control of each link in

the food chain have become particularly relevant. Furthermore, although EU law no. 178 came into effect on the 1st January 2005, at the time of writing the regulatory situation is very confused.
The aim of this paper is to analyze legal and regulatory aspects of food traceability, and to provide a general framework for the identification of fundamental mainstays and functionalities in an effective traceability system.
Possible technical resources were clarified by analyzing assessment criteria obtained from studies of alphanumerical codes, bar codes, and radio frequency identification (RFID).
Finally, the paper presents the traceability system used by Parmigiano Reggiano (the famous Italian cheese) which was developed using the proposed general framework. Based on an integration of alphanumerical codes and RFID technology, the system is working well with very good results for both cheese producers and consumers.
Some interesting observations concerning development trends and traceability system costs close the paper.
Keywords: Food traceability; Framework; Bar code; RFID; Parmigiano Reggiano

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

, Position of the American Dietetic Association: Total Diet Approach to Communicating Food and Nutrition Information, Journal of the American Dietetic Association, Volume 107, Issue 7, July 2007, Pages 1224-1232, ISSN 0002-8223, DOI: 10.1016/j.jada.2007.05.025.

(http://www.sciencedirect.com/science/article/B758G-4P2M748-14/2/7acb971277fb64d964b456f1dcbcb79c)
Abstract:
It is the position of the American Dietetic Association that the total diet or overall pattern of food eaten is the most important focus of a healthful eating style. All foods can fit within this pattern, if consumed in moderation with appropriate portion size and combined with regular physical activity. The American Dietetic Association strives to communicate healthful eating messages to the public that emphasize a balance of foods, rather than any one food or meal.

Public policies that support the total diet approach include the Dietary Guidelines for Americans, MyPyramid, the DASH Diet (Dietary Approaches to Stop Hypertension), Dietary Reference Intakes, and nutrition labeling. The value of a food should be determined within the context of the total diet because classifying foods as 'good' or 'bad' may foster unhealthful eating behaviors. Alternative approaches may be necessary in some health conditions. Eating practices are dynamic and influenced by many factors, including taste and food preferences, weight concerns, physiology, lifestyle, time challenges, economics, environment, attitudes and beliefs, social/cultural influences, media, food technology, and food product safety. To increase the effectiveness of nutrition education in promoting sensible food choices, food and nutrition professionals should utilize appropriate behavioral theory and evidence-based strategies. A focus on moderation and proportionality in the context of a healthful lifestyle, rather than specific nutrients or foods, can help reduce consumer confusion. Proactive, empowering, and practical messages that emphasize the total diet approach promote positive lifestyle changes.

Mohammed Aider, Damien de Halleux, Isomerization of lactose and lactulose production: review, Trends in Food Science & Technology, Volume 18, Issue 7, July 2007, Pages 356-364, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.03.005.
(http://www.sciencedirect.com/science/article/B6VHY-4NB99D3-3/2/f3f8ecb7e979fae68aa73fc4a79ca8d9)
Abstract:
Lactulose is widely used in pharmaceutical, nutraceuticals and food industries because of its beneficial effects on human health. Technology of lactulose production is mainly based on the isomerization reaction of lactose in alkaline media. However, information available on this subject is very varied. This study is a summary of the principal techniques used for lactulose production in order to gather maximum information in one manuscript for a better comprehension of the technological characteristics and specificities of lactulose synthesis.

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

Carrie M. Hew, Maher Korakli, Rudi F. Vogel, Expression of virulence-related genes by Enterococcus faecalis in response to different environments, Systematic and Applied Microbiology, Volume 30, Issue 4, 15 June 2007, Pages 257-267, ISSN 0723-2020, DOI: 10.1016/j.syapm.2006.08.002.
(http://www.sciencedirect.com/science/article/B7GVX-4M0J4J1-1/2/e31c83b4339377ee07aa5f6106ff0cee)
Abstract:
Enterococci are ubiquitous organisms used to both improve the flavor and texture of fermented foods, and provide protective mechanisms as either a probiotic or antimicrobial additive. However, two species, E. faecalis and E. faecium, are also associated with 10% of nosocomial infections of the bloodstream, wounds, urinary tract and heart. While the genes involved in the pathogenicity of these organisms are slowly identified along with the mechanisms behind their regulation, the environmental signals involved in the conversion to pathogenicity remain unclear. The distribution of virulence genes was determined in 13 E. faecalis isolates from medical, food and animal sources. Regardless of their source of isolation, all isolates harbored between eight and thirteen virulence genes. Relative differences in expression of the virulence associated genes clpP, clpX, gls24, agg, efaA, gelE, and cylBLL were examined in E. faecalis TMW 2.63 and TMW 2.622 exposed to different environments (LB, BHI, respective supernatants, pig fecal extract, LB+6.5% NaCl, LB+pH5, LB+6.5% NaCl+pH5, and sausage medium) using RT-PCR and Lightcycler(R) technology. Significant differences in expression were influenced by growth phase, environment, and isolate, which suggests that these three factors be taken into consideration during the selection of enterococci for use in foods or as probiotics rather than their source of isolation or set of virulence genes.
Keywords: Enterococci; Probiotics; Virulence genes; Pathogenicity

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

Sun Young Hwang, So Hyun Kim, Eun Joo Jang, Nam Hoon Kwon, Young Kyung Park, Hye Cheong Koo, Woo Kyung Jung, Jun Man Kim, Yong Ho Park, Novel multiplex PCR for the detection of the Staphylococcus aureus superantigen and its application to raw meat isolates in Korea, International Journal of Food Microbiology, Volume 117, Issue 1, 10 June 2007, Pages 99-105, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.02.013.
(http://www.sciencedirect.com/science/article/B6T7K-4N6FFGH-7/2/76ea7fcd8ffc01a6cb3bf020aa6d90f2)
Abstract:
A multiplex PCR assay that allows for the rapid screening of the 19 genes that encode staphylococcal enterotoxins (SEs) (sea to see, and seg to sei), SE-like (SEl) toxins (sej to ser, and seu), and toxic shock syndrome toxin-1 (TSST-1) (tst) was developed in this study. These toxins are included in the pyrogenic toxin superantigen (PTSAg) family and are responsible for many diseases such as staphylococcal food poisoning (SFP) and TSS. The primers were designed based on dual priming oligonucleotide (DPO) technology to detect all of the 19 SAg genes in three sets of PCR. The developed multiplex PCR was applied to 143 Staphylococcus aureus strains isolated from pork and chicken meat in Korea. Almost 50% of the strains possessed at least one of the 19 SAg genes. The most frequently found genes were seg, sei, sem, and sen (53 isolates, 37%), which were often found simultaneously in the same isolate. In those isolates, the seo (39 isolates, 27%) or seu (6 isolates, 4%) genes were frequently found together and this combination (seg, sei, sem, sen, and seo or seu) was considered to be a part of the enterotoxin gene cluster (egc). The sea gene (10 isolates, 7%) was the gene most frequently detected out of all the classical SE genes (sea to see). Although these classical SEs are considered to be major etiological factors in SFP, newly described SE or SEl genes (seg to ser, and seu) were more frequently detected than the classical SE genes in this study. There was no isolate detected containing the seb, sec, sek, sel, or seq genes. S. aureus possessing mobile genetic elements known to encode these SAg genes, such as egc, were presumed to be widely distributed among pork and chicken meats in Korea. The multiplex PCR developed in this study could be applied to the investigation of SAg genes in S. aureus strains isolated from various sources.
Keywords: Staphylococcal enterotoxin; Superantigen; Multiplex PCR; DPO; egc

Xiao-hui QU, Da-fang ZHUANG, Dong-sheng QIU, Studies on GIS Based Tracing and Traceability of Safe Crop Product in China, Agricultural Sciences in China, Volume 6, Issue 6, June 2007, Pages 724-731, ISSN 1671-2927, DOI: 10.1016/S1671-2927(07)60105-9.
(http://www.sciencedirect.com/science/article/B82XG-4P48RF7-D/2/46e4676ebaae9cf4a1af4f37db828d34)
Abstract: Abstract
The safety of safe crop products (SCP) is critical to maintain people's health and living standard. With the global efforts on the improvement of the traceability of food products, it is inevitable to establish corresponding traceability systems to monitor the safety of crop products in China. In this article, the supply chain pattern of SCP in China has been analyzed and its spatial characters have been described in detail. The study deals with on how to relate traceability technology with GIS, and on how to trace and retrace the safety of SCP using the function of excellent spatial

representation, spatial locating, and spatial analysis provided in GIS, which has been discussed from several aspects, such as coding technique of traceability information, transferring technique of traceability information, spatialization of traceability information, and application integration of traceability system. A pilot study was carried out to present the basic functions of the system, which provided an efficient and credible way to trace and retrace the safety of SCP in a real supply chain. An innovative idea has been brought forward for how to establish an efficient, credible, applied traceability system of SCP.
Keywords: safe crop products (SCP); tracing and traceability; GIS; traceability code; information transformation

J. van Dam, A.P.C. Faaij, I. Lewandowski, G. Fischer, Biomass production potentials in Central and Eastern Europe under different scenarios, Biomass and Bioenergy, Volume 31, Issue 6, June 2007, Pages 345-366, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2006.10.001.
(http://www.sciencedirect.com/science/article/B6V22-4NF2H8K-1/2/2668dfb4abc84beff9e576997238490f)
Abstract:
A methodology for the assessment of biomass potentials was developed and applied to Central and Eastern European countries (CEEC). Biomass resources considered are agricultural residues, forestry residues, and wood from surplus forest and biomass from energy crops. Only land that is not needed for food and feed production is considered as available for the production of energy crops. Five scenarios were built to depict the influences of different factors on biomass potentials and costs. Scenarios, with a domination of current level of agricultural production or ecological production systems, show the smallest biomass potentials of 2-5.7 EJ for all CEEC. Highest potentials can reach up to 11.7 EJ (85% from energy crops, 12% from residues and 3% from surplus forest wood) when 44 million ha of agricultural land become available for energy crop production. This potential is, however, only realizable under high input production systems and most advanced production technology, best allocation of crop production over all CEEC and by choosing willow as energy crops. The production of lignocellulosic crops, and willow in particular, best combines high biomass production potentials and low biomass production costs. Production costs for willow biomass range from 1.6 to 8.0 [euro]/GJ HHV in the scenario with the highest agricultural productivity and 1.0-4.5 [euro]/GJ HHV in the scenario reflecting the current status of agricultural production. Generally the highest biomass production costs are experienced when ecological agriculture is prevailing and on land with lower quality. In most CEEC, the production potentials are larger than the current energy use in the more favourable scenarios. Bulk of the biomass potential can be produced at costs lower than 2 [euro]/GJ. High potentials combined with the low cost levels gives CEEC major export opportunities.
Keywords: Biomass potential; Biomass cost-supply curves; Central and Eastern European countries (CEEC)

Barry D. Solomon, Justin R. Barnes, Kathleen E. Halvorsen, Grain and cellulosic ethanol: History, economics, and energy policy, Biomass and Bioenergy, Volume 31, Issue 6, June 2007, Pages 416-425, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2007.01.023.
(http://www.sciencedirect.com/science/article/B6V22-4N7YFWT-3/2/26b377d735b2a30e206fa35ed64903cf)
Abstract:
The United States (US) and Brazil have been the two leading producers of fuel ethanol since the 1970s. National policies have supported the production and use of ethanol from corn and sugarcane. US support in particular has included exemption from federal gasoline excise taxes, whole or partial exemption from road use (sales) taxes in nine states, a federal production tax credit, and a federal blender's credit. In the last decade the subsidization of grain-based ethanol has been increasingly criticized as economically inefficient and of questionable social benefit. In

addition, much greater production of ethanol from corn may conflict with food production needs. A promising development is the acceleration of the technical readiness of cellulosic alcohol fuels, which can be produced from the woody parts of trees and plants, perennial grasses, or residues. This technology is now being commercialized and has greater long-term potential than grain ethanol. Cellulosic ethanol is projected to be much more cost-effective, environmentally beneficial, and have a greater energy output to input ratio than grain ethanol. The technology is being developed in North America, Brazil, Japan and Europe. In this paper, we will review the historical evolution of US federal and state energy policy support for and the currently attractive economics of the production and use of ethanol from biomass. The various energy and economic policies will be reviewed and assessed for their potential effects on cellulosic ethanol development relative to gasoline in the US.
Keywords: Biomass; Cellulosic ethanol; Corn; Energy Policy Act; Excise tax; Gasohol; MTBE

Mauro Conter, Emanuela Zanardi, Sergio Ghidini, Luca Pennisi, Alberto Vergara, Giorgio Campanini, Adriana Ianieri, Survey on typology, PRPs and HACCP plan in dry fermented sausage sector of Northern Italy, Food Control, Volume 18, Issue 6, June 2007, Pages 650-655, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2006.03.001.
(http://www.sciencedirect.com/science/article/B6T6S-4JSFVB2-1/2/19b6159279b2525a852964357235c2a9)
Abstract:
One hundred and fifty four dry fermented sausage small and medium-sized enterprises (SMEs) were visited in Northern Italy, to collect information on building and facilities, production technology and marketing organization. Five businesses, out of 154, were then selected with the aim of analysing their prerequisite programmes (PRPs) and the level of hazard analysis and critical control point (HACCP) system implementation. The results of this survey acknowledge the importance of small enterprises in the dry fermented sausage production sector. This study shows that fully compliance with PRPs and HACCP is far from complete, especially in micro-sized businesses, in spite of derogations for small establishments provided by Italian and European rules. In order to help SMEs to comply with food safety objectives, collaboration with Local Health Unit officers always proves positive for the businesses because they can inform and support enterprises, particularly small food premises.
Keywords: Prerequisite programme; HACCP; SMEs; Dry fermented sausages

Mei-Fang Chen, Hsiao-Lan Li, The consumer's attitude toward genetically modified foods in Taiwan, Food Quality and Preference, Volume 18, Issue 4, June 2007, Pages 662-674, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2006.10.002.
(http://www.sciencedirect.com/science/article/B6T6T-4MH2BTR-1/2/fbf065ff12b1970dae380e11984c7555)
Abstract:
The present study examines the factors that have influences upon benefit and risk perceptions of applying gene technology to food production, perceptions that may in turn determine the consumer's attitude toward genetically modified (GM) foods in Taiwan. Results of structural equation modeling analysis give evidence that general attitude toward and trust in institutes and scientists performing gene manipulation have positive impacts on the perceived benefits, but knowledge has negative impacts on the perceived risks of applying gene technology to produce food products. The consumer's attitude toward GM foods is mainly determined by the consumer's benefit perception. Recommendations for regulating agencies and related industries in the GM food area and suggestions for future research are discussed.
Keywords: Genetically modified (GM) foods; Perceived benefits; Perceived risks; Knowledge; Trust

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

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

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

Yeun Suk Gu, Eric. A. Decker, D. Julian McClements, Application of multi-component biopolymer layers to improve the freeze-thaw stability of oil-in-water emulsions: [beta]-Lactoglobulin-[iota]-carrageenan-gelatin, Journal of Food Engineering, Volume 80, Issue 4, June 2007, Pages 1246-1254, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.09.015.
(http://www.sciencedirect.com/science/article/B6T8J-4M7CM8W-1/2/337975aeb19008a90e9154db69506de9)
Abstract:
This study examines the influence of interfacial composition on the freeze-thaw stability of oil-in-water emulsions. Three 5% w/w oil-in-water emulsions (5 mM phosphate buffer, pH 6.0) were prepared using the layer-by-layer electrostatic deposition method that had different interfacial compositions: (i) primary emulsion ([beta]-Lg); secondary emulsion ([beta]-Lg-[iota]-carrageenan); (iii) tertiary emulsion ([beta]-Lg-[iota]-carrageenan-gelatin). The primary, secondary and tertiary emulsions were subjected to from one to three freeze-thaw cycles (-20 [degree sign]C for 22 h, +40 [degree sign]C for 2 h) in the absence or presence of sucrose (10% w/w), and then their stability was assessed by [zeta]-potential, particle size, microstructure and creaming stability measurements. In the absence of sucrose, the primary and secondary emulsions were highly unstable to droplet aggregation and creaming after three freeze-thaw cycles, whereas the tertiary emulsion was stable, which was attributed to the relatively thick biopolymer layer surrounding the oil droplets. In the presence of 10% w/w sucrose, all of the emulsions were much more stable, which can be attributed to the ability of sucrose to increase the amount of non-frozen aqueous phase in the emulsions. The interfacial engineering technology used in the study could therefore lead to the creation of food emulsions with improved stability to freezing and thawing.
Keywords: Emulsion; [iota]-Carrageenan; [beta]-Lactoglobulin; Gelatin; Freeze-thaw stability

F. Barillet, Genetic improvement for dairy production in sheep and goats, Small Ruminant Research, Volume 70, Issue 1, The Outlook for Quantitative and Molecular Genetic Applications in Improving Sheep and Goats, June 2007, Pages 60-75, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2007.01.004.
(http://www.sciencedirect.com/science/article/B6TC5-4N1SJVN-1/2/f6e11eb74eeeb8f854d4e6b21de85c2c)
Abstract:

Functional traits have become important for efficient breeding schemes in the dairy goat and sheep industries, mainly in Mediterranean countries, due to increased costs of production relative to milk prices and consumers demand for safe, quality food and attention to animal welfare. The challenge facing the European dairy sheep and goat sector is to cost-effectively produce typical cheeses attractive to the consumer, i.e. of high quality and perceived to be safe, while maintaining production in less favoured rural regions. The emphasis for functional traits related to udder morphology and health, at the moment on a quantitative genetics basis, has resulted from the knowledge established during the last decade that selection on milk traits only, as practiced for several decades for breeds benefiting from efficient breeding schemes, would lead in the long term to 'baggy' udders that are more difficult to milk by machine and more susceptible to mastitis. At the same time another window has been opened based on new molecular tools allowing the detection and mapping of genes of economic importance in farm animals. To date, marker- or gene-assisted selection (MAS/GAS) has been applied in dairy small ruminants either for introgression of a major gene such as the Booroola mutation or for selection of major genes such as the polled mutation and [alpha]s1-casein gene in goats, or the PrP gene for scrapie resistance in sheep. These applications clearly showed the need for balance over time between selection for polygenes and the major gene for a given trait, or between increasing frequency of favorable alleles of a major gene while maintaining selection for other traits and the genetic variability within the breed. It showed that the selection for major genes will be more profitable at the breed level if an efficient breeding scheme is already running to be able to account for these optimizations over time. Moreover attention is also turning to the mapping of quantitative trait loci (QTL) for production and functional traits. Results are promising since numerous QTL have now been detected, mainly in dairy sheep, showing that cattle results can be partly transferred to dairy small ruminants. But QTL fine mapping is a crucial next step before any application of MAS/GAS because of the need to dramatically reduce genotyping costs for these species. Finally, given the large differences among existing breeding programmes for dairy sheep and goats, the ability to use these new technologies and molecular knowledge in the breeding schemes will probably be breed dependent at least in a near future.
Keywords: Dairy sheep; Dairy goats; Selection; Dairy traits; Functional traits; Polygenic variability; QTL; Major genes; Breeding schemes

Robin C. McKellar, Effect of sub-lethal heating and growth temperature on expression of the ribosomal RNA rrnB P2 promoter during the lag phase of Pseudomonas fluorescens, International Journal of Food Microbiology, Volume 116, Issue 2, 10 May 2007, Pages 248-259, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2007.01.009.
(http://www.sciencedirect.com/science/article/B6T7K-4N25VNW-4/2/33c3cafeff8bb4fcc0a4f9841cb344d3)
Abstract:
Current models for the lag phase of food-borne pathogens are limited by our poor understanding of the physiological changes taking place as bacterial cells prepare for exponential growth. In a previous paper in this series, a strain of Pseudomonas fluorescens containing the Tn7-luxCDABE gene cassette regulated by the rRNA promoter rrnB P2 was used to measure the influence of starvation on the lag phase duration (LPDOD) and growth rate (ROD). rrnB P2 promoter activity increased exponentially during the lag phase, and was characterized by lag (LPDExp) and rate (RExp) parameters. In the present study, this work was expanded to include the influence of growth temperature (10 to 30 [degree sign]C) and exposure to sub-lethal heating at 47 [degree sign]C. With these additional datasets, the LPDExp was often more pronounced than had been noted with starvation, so the original exponential association model (EXP) was compared to logistic and Gompertz (GOM) models. Based on root mean square error, the GOM model gave the better fit for some of the sub-lethal heating and growth temperature datasets; however, the EXP model was assessed as best overall. Increased growth temperature and decreased time of sub-

lethal heating produced significant decreases in LPDOD and LPDExp and increases in ROD and RExp. The results suggest that different stressors have differential effects on gene expression and subsequent growth.
Keywords: Modelling; Ribosome; Lag phase; Pseudomonas; Lux technology; Gene expresion

Dang K. Nhan, Le T. Phong, Marc J.C. Verdegem, Le T. Duong, Roel H. Bosma, David C. Little, Integrated freshwater aquaculture, crop and livestock production in the Mekong delta, Vietnam: Determinants and the role of the pond, Agricultural Systems, Volume 94, Issue 2, May 2007, Pages 445-458, ISSN 0308-521X, DOI: 10.1016/j.agsy.2006.11.017.
(http://www.sciencedirect.com/science/article/B6T3W-4MW90GB-2/2/ea2c5a7260d4aaee666a70cf29fc9bd2)
Abstract:
Promotion of integrated aquaculture with agriculture, including crops and livestock (IAA-farming), requires consideration of both bio-physical and socio-economic contexts. The major factors influencing the adoption of IAA-farming by households at three sites in the Mekong delta were identified. Special attention was given to the multiple roles ponds play in IAA-farming systems. Information was collected through semi-structured interviews and discussions with focus groups and key individuals. Data were analyzed using multivariate factor analysis, analysis of variance or participatory ranking methods. Three major IAA-systems were identified: (1) low-input fish farming integrated with intensive fruit production (system 1), (2) medium-input fish farming integrated with less intensive fruit production (system 2), and (3) high-input fish farming integrated with less intensive fruit production (system 3). System 1 was commonly practised in a rural fruit-dominated area with fertile soils, while systems 2 and 3 were more evident in peri-urban rice-dominated areas with less fertile soils. In the study area, only 6% of poor farmers adopted IAA-farming, while this was 42% for intermediate and 60% for rich households. Richer farmers tended to intensify fish farming and seek a more commercial orientation. The major factors why farmers did not start aquaculture were the inappropriateness of technology, insufficient land holding or poor access to extension services, limited farm management, and through a fear of conflicts associated with pesticide use on crops. The main motivations for practising IAA-farming included increased income and food for home consumption from the available farm resources while reducing environmental impacts. Further improvements to IAA-systems can be realized by strengthening nutrient recycling between different IAA-system components while enhancing farming output and safeguarding the environment.
Keywords: Integrated agriculture-aquaculture; Participatory approach; Factor analysis; Nutrient recycling; Vietnam

Daniel A. Devcich, Irene K. Pedersen, Keith J. Petrie, You eat what you are: Modern health worries and the acceptance of natural and synthetic additives in functional foods, Appetite, Volume 48, Issue 3, May 2007, Pages 333-337, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.09.014.
(http://www.sciencedirect.com/science/article/B6WB2-4MFKCXC-1/2/1e62003fbc01f48cbe40d795ee2ff253)
Abstract:
There is an increasing array of functional foods available that are designed to confer health benefits. However, individuals' worries about new technology and modernity may influence the acceptance of these products. In this study, we investigated how modern health worries influence attitudes and decisions about functional foods. We asked participants (n=390) to rate pictures of products with either added vitamins or added scientific compounds. Each product shown purported to have one of three possible targeted effects: to reduce the likelihood of a disease, to reduce a risk factor associated with a disease, or to improve personal appearance. We found levels of modern health worries to be significantly associated with participants' reports of organic food consumption and presence of food allergies. Modern health worries were also significantly related

to a preference for foods with natural as opposed to synthetic additives. Participants with higher levels of modern health worries had a greater acceptance of functional foods designed to reduce the likelihood of disease compared to participants with low modern health worries. Overall, the results suggested that modern health worries are an important psychological factor to consider with regards to attitudes toward functional foods.
Keywords: Functional foods; Modernity; Psychology; Modern health worries; Food additives

Osten Jensen, Anders Sunde Wroldsen, Pal Furset Lader, Arne Fredheim, Mats Heide, Finite element analysis of tensegrity structures in offshore aquaculture installations, Aquacultural Engineering, Volume 36, Issue 3, May 2007, Pages 272-284, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2007.01.001.
(http://www.sciencedirect.com/science/article/B6T4C-4MTC6HW-2/2/c669e84b62a7ba64bd01e8c67aa9dcde)
Abstract:
Aquaculture is the fastest growing food producing sector in the world. Considerable interest exists in developing open ocean aquaculture in response to a shortage of suitable, sheltered inshore locations and possible husbandry advantages of oceanic sites such as increased water quality and oxygen supply, which improve production efficiency and the quality of fish. The extreme weather conditions experienced offshore leads to a focus on new structure concepts, remote monitoring and a higher degree of automation in order to keep the cost of constructions with an economically viable range. This paper proposes tensegrity structures in the design of wave compliant structures for offshore aquaculture. The objective of this paper is to study several different combinations of pre-stress and stiffness and determine how they influence the stiffness of the tensegrity structure. The finite element analysis program ABAQUS(TM) has been used to investigate the load carrying capacity of a tensegrity beam structure. The stiffness properties of the tensegrity beam were observed to be highly non-linear and dependent on pre-stress and spring stiffness. When designing a tensegrity beam, both pre-stress and spring stiffness should be considered to ensure the desired structural properties. A large strength to mass ratio and promising properties with respect to control of geometry, stiffness and vibration could make tensegrity an enabling technology for future developments. The suggested concept, the tensegrity beam, shows promising stiffness properties in tension, compression and bending, which are relevant for development of open ocean aquaculture construction for high energy environments.
Keywords: Open ocean aquaculture; Tensegrity structures; Finite element analysis

Zivile Luksiene, Honorata Danilcenko, Zivile Taraseviciene, Zilvinas Anusevicius, Audrone Maroziene, Henrikas Nivinskas, New approach to the fungal decontamination of wheat used for wheat sprouts: Effects of aminolevulinic acid, International Journal of Food Microbiology, Volume 116, Issue 1, 1 May 2007, Pages 153-158, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.12.040.
(http://www.sciencedirect.com/science/article/B6T7K-4MY0MC0-1/2/221cad6e4dee316c5264a3145e72cfda)
Abstract:
Nowadays, there is a growing interest in natural, minimally processed, nutritional and healthy foods. Sprouted seeds can be offered as natural nutritive products. Regrettably, existing seed decontamination technologies are limited and have specific disadvantages. 5-aminolevulinic acid (5-ALA) as a novel and effective tool for wheat decontamination from microfungi is proposed in this work. Inhibition of wheat with 5-ALA revealed a drastically suppressed development of microfungi. Studies of wheat germination characteristics showed that 5-ALA stimulates the growth of wheat seedlings and roots without impairing the vigor of germination and the viability of seeds. 5-ALA also induces either marginal or significant activities of antioxidant enzymes which can be associated with enhanced cellular capacity to detoxify reactive oxygen species. The results

indicate that 5-ALA application may be an effective, environmentally friendly and inexpensive technology to be used in producing sprouts for human consumption.
Keywords: 5-Aminolevulinic acid; Wheat seeds; Germination; Microfungi; Antioxidant enzymes

F. Dal Bello, C.I. Clarke, L.A.M. Ryan, H. Ulmer, T.J. Schober, K. Strom, J. Sjogren, D. van Sinderen, J. Schnurer, E.K. Arendt, Improvement of the quality and shelf life of wheat bread by fermentation with the antifungal strain Lactobacillus plantarum FST 1.7, Journal of Cereal Science, Volume 45, Issue 3, May 2007, Pages 309-318, ISSN 0733-5210, DOI: 10.1016/j.jcs.2006.09.004.
(http://www.sciencedirect.com/science/article/B6WHK-4MJBTKX-1/2/57cb68f40cf62198d4e59f09f1bdef13)
Abstract:
Lactobacillus plantarum FST 1.7 was screened for in vitro antimicrobial activity and was shown to be active against spoilage moulds and bacteria. Isolation of antimicrobial compounds from cell-free supernatant identified lactic acid, phenyllactic acid and the two cyclic dipeptides cyclo (l-Leu-l-Pro) and cyclo (l-Phe-l-Pro) as the major components responsible for this activity. L. plantarum FST 1.7 was tested for the ability to produce the antifungal compounds during sourdough fermentation and to produce bread of good quality and increased shelf-life. A rheofermentometer was used to examine the gaseous release and development characteristics of the dough. A range of parameters was determined including pH, TTA and specific loaf volume. The results were compared with those obtained using Lactobacillus sanfranciscensis, a chemically acidified and a non-acidified dough. The quality of sourdough and bread produced using L. plantarum FST 1.7 was comparable to that obtained using common sourdough starters, e.g. L. sanfranciscensis. Sourdoughs and breads were evaluated for the ability to retard growth of Fusarium culmorum and Fusarium graminearum two fungi found on breads. Sourdough and bread produced with strain FST 1.7 showed consistent ability to retard the growth of both Fusarium species, thus indicating that L. plantarum FST 1.7 has also the potential to improve the shelf-life of wheat bread.
Keywords: Wheat bread; Lactobacillus; Antifungal; Cyclic dipeptides

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

K. Chao, Y.-R. Chen, F. Ding, C.-C. Yang, D.E. Chan, Development of two-band color-mixing technique for identification of broiler carcass conditions, Journal of Food Engineering, Volume 80, Issue 1, May 2007, Pages 276-283, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.05.024.
(http://www.sciencedirect.com/science/article/B6T8J-4KCXJ5J-2/2/9b33bb98eadbd9e75618f2d58124ecb9)
Abstract:
The development of accurate, rapid, and non-invasive inspection technologies are needed to help poultry processors meet food safety regulations and rising consumer demand while increasing productivity and economic competitiveness. This paper reports on a novel two narrow-band color-mixing technique for identification of broiler chicken carcass conditions. Spectra were collected for samples cut from the breast area of 103 wholesome chicken carcasses, 66 systemically diseased chicken carcasses, and 40 cadaver chicken carcasses using a photodiode array spectrophotometer system. Waveband pairs in the range of 416-715 nm were evaluated for identifying chicken conditions using the two-band color-mixing technique, and the pair of (453 nm, 589 nm) was selected based on color difference index calculations in CIELUV color space. Significant differences in the color characteristics of wholesome, systemically diseased, and cadaver chicken conditions, based on color-mixing using the two selected wavebands, were confirmed by one-way analysis of variance. Decision-tree classification models using the calculated color difference indexes were evaluated first by using the spectral data divided into a validation set and a testing set, and second by 10-fold cross-validation of the entire data set. Classification accuracies achieved for the wholesome, systemically diseased, and cadaver samples were 95.8%, 95.5%, and 100%, respectively, for the validation set; 94.6%, 100%, and 90.6%, respectively, for the testing set; and 98.1%, 97.5%, and 93.9%, respectively, when using 10-fold cross-validation.
Keywords: CIELUV; Food safety; Poultry; Spectroscopy

Nazrul I. Shaikh, Vittal Prabhu, Mathematical modeling and simulation of cryogenic tunnel freezers, Journal of Food Engineering, Volume 80, Issue 2, May 2007, Pages 701-710, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.04.065.
(http://www.sciencedirect.com/science/article/B6T8J-4KV2R6W-3/2/543c59b240c783c1c80e2427514b9079)
Abstract:
Modern food industries employ either mechanical or cryogenic methods for freezing products. A wealth of literature is available on design, implementation and optimization of mechanical freezing systems in the food industry. Cryogenic freezing is a relatively new technology for the food industry and there is a need for developing mathematical models to characterize this technology. Our focus here is to develop analytical and numerical models for describing the dynamics of the cryogenic freezing tunnel system. Two models for sizing and rating of the tunnel freezer have been developed. A composite model combining the freezer and the food freezing dynamics using a two step finite difference methods has been proposed for sizing the tunnel freezer. The error in prediction the temperature profile of the food material and the tunnel freezer is reduced to less than 5%, consequently reducing cryogen consumption by up to 30%. The proposed model can be useful for minimizing the operating costs of tunnel freezers by deriving suitable control strategies and provide insights for improvements in their design. A dynamic tank model has been developed for rating the tunnel freezer. The tank model guarantees stability of the system, is accurate, and can be readily extended to complex designs and applications where there are multiple zones with nozzles and fans.
Keywords: Cryogenic tunnel freezer; Mathematical modeling

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

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

Ute Schweiggert, Reinhold Carle, Andreas Schieber, Conventional and alternative processes for spice production - a review, Trends in Food Science & Technology, Volume 18, Issue 5, May 2007, Pages 260-268, ISSN 0924-2244, DOI: 10.1016/j.tifs.2007.01.005.
(http://www.sciencedirect.com/science/article/B6VHY-4MY0MG0-1/2/ad6f9c9219b1a2f14959ff528f2e1095)
Abstract:
Conventional production of spices implicates a number of hygienic problems which can pose tremendous risks for farmers, producers and consumers. Furthermore, food quality may also be adversely affected. Only few conventional technologies exist for the sanitation of spices, however, some applications such as the fumigation with ethylene oxide are restricted and even banned by law in the European Union. As a consequence, there is a need for the development of innovative technologies for the production of high quality spices. This contribution summarizes the major problems associated with conventional spice production and provides a review of alternative technologies developed very recently.

Tiziana Parton, Alberto Bertucco, Nicola Elvassore, Luana Grimolizzi, A continuous plant for food preservation by high pressure CO2, Journal of Food Engineering, Volume 79, Issue 4, April 2007, Pages 1410-1417, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.04.023.
(http://www.sciencedirect.com/science/article/B6T8J-4JW7FG7-F/2/a3d9e25310f70a75002060b09172f304)
Abstract:
A continuous plant specifically designed for microbial inactivation by high pressure CO2 is presented. The pilot plant was built to check the high pressure CO2 pasteurization method on pumpable foodstuffs in an apparatus suitable for development at industrial scale.
Results are reported on both simple and complex substrates. First, model suspension with selected microbial strain as test microorganism was tested at 110 bar, 27 [degree sign]C and 36 [degree sign]C, then fresh foodstuffs were treated in their natural condition. The operating temperature was always between 26 and 40 [degree sign]C, the pressure between 80 and 110 bar.
In physiological saline solution, inoculated with Bacillus subtilis, total inactivation degree was achieved. The effectiveness of the proposed technology for food pasteurization was successfully checked at particularly mild conditions on natural grape must. The high pressure CO2 pasteurization was effective with natural red orange juice and commercial inoculated tomato paste as well, whereas natural tomato paste proved to be resistant to the CO2 treatment.
Keywords: Continuous process; Pasteurization; High pressure CO2; Food inactivation; High pressure plant; Fresh foodstuffs

Marit Beckeman, Christina Skjoldebrand, Clusters/networks promote food innovations, Journal of Food Engineering, Volume 79, Issue 4, April 2007, Pages 1418-1425, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.04.024.
(http://www.sciencedirect.com/science/article/B6T8J-4JW7FG7-5/2/b9594bc9ebad195242fbced2f27c5e1c)
Abstract:
Innovations are necessary for growth and competitiveness, but few are taking place in the food industry. Clusters and networks in regions/countries are seen as one way of increasing the chances to compete, based on Porter's theories in 1990. Before that some articles existed about agglomeration, clustering of industries etc. but not many examples in the food industry seem to have been studied. This paper describes the major innovations and changes since 1945 in the food sector, based on open-ended interviews with experts in the field, and the society is analysed in line with the factors proposed by Porter in his 'diamond'. Frozen food was seen as the really new innovation on the Swedish market and the paper describes how this new technology was

introduced and gained acceptance. A network of individuals and organisations assembled around the Frozen Food Institute, backed by the government, and worked on creating and getting the information across to everyone in the supply chain. A cluster of food producers and supporting industries formed spontaneously in the south of Sweden and existed until the technology became a commodity. In the terms of current literature the cluster was a 'bottom-up' initiative, with several entrepreneurs involved. The chances for radical or new food innovations are discussed, but they are going to require other actors and to overcome the generally negative attitude today towards industry and the food industry in particular.
Keywords: Frozen food; Self-service; Chilled food; Radical-new-incremental innovation

Tatiana A. Novoselova, Miranda P.M. Meuwissen, Ruud B.M. Huirne, Adoption of GM technology in livestock production chains: an integrating framework, Trends in Food Science & Technology, Volume 18, Issue 4, April 2007, Pages 175-188, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.12.005.
(http://www.sciencedirect.com/science/article/B6VHY-4MNYYWG-1/2/d333c4a80324edea66221c3899c448e9)
Abstract:
This paper presents an integrating framework for analysing the adoption of new technologies in food chains. We review the literature on the adoption of genetic modification in livestock production chains and conclude that an integrated chain approach is currently lacking. Such an approach is, however, essential to analysing the adoption of technologies, such as genetic modification in livestock production. The proposed framework integrates consumers and chain participants and their concerns and benefits.

Sinikka Jaakohuhta, Harri Harma, Mika Tuomola, Timo Lovgren, Sensitive Listeria spp. immunoassay based on europium(III) nanoparticulate labels using time-resolved fluorescence, International Journal of Food Microbiology, Volume 114, Issue 3, 20 March 2007, Pages 288-294, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.09.025.
(http://www.sciencedirect.com/science/article/B6T7K-4MJRYVT-5/2/e835af941a9d71e051da1a55f8710311)
Abstract:
Listeria spp. are Gram-positive rod shaped bacteria found universally in the environment. Pathogenic Listeria monocytogenes is seldom harmful to healthy adults, but can cause serious disease, listeriosis, especially to pregnant women, neonates, and elderly or immunocompromised people. Conventional methods for screening Listeria in food samples are time consuming and laborious, involving the use of a range of liquid media and plate cultures. In the current study, the total analysis time was shortened by employing a sensitive Listeria assay, which was able to detect the bacteria in low concentrations. Sensitivity of the sandwich immunoassay was substantially improved by utilizing europium(III)-chelate containing latex nanoparticles as tracers. Each 107 nm nanoparticle contained approximately 31 000 europium(III)-chelates which enhanced the specific activity of the label. The sensitive nanoparticulate immunoassay developed for Listeria spp. was performed in one-step and two-step formats. One-step assay was notably faster, 15 min, and simpler to execute having analytical sensitivity of 300 CFU/ml and a dynamic range of three orders of magnitude. The sensitivity, 20 CFU/ml, of the 4 h two-step assay clearly exceeded that of the one-step assay, and the dynamic range was nearly five orders of magnitude. Food and environmental samples were measured against a commercial L. monocytogenes immunoassay with good correlation. The developed sensitive assay enabled shorter sample enrichment times and, therefore, faster analysis of Listeria spp. Obviously the detection of several other bacteria can also be enhanced by applying the nanoparticle assay technology.
Keywords: Listeria; Nanoparticle label; Time-resolved fluorescence; Immunoassay

L. Alvarez-Lajonchere, M.A. Reina Canez, M.A. Camacho Hernandez, S. Kraul, Design of a pilot-scale tropical marine finfish hatchery for a research center at Mazatlan, Mexico, Aquacultural Engineering, Volume 36, Issue 2, March 2007, Pages 81-96, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2006.07.003.
(http://www.sciencedirect.com/science/article/B6T4C-4KK2R70-1/2/59d0aa307fbfa017915f5e37d86038dd)
Abstract:
A multispecies, 2668 m2 pilot-scale tropical marine finfish hatchery was designed to fulfill the requirements of finfish juvenile research and development (R&D) at the Research Center for Food and Development, in Mazatlan, Mexico. The main goals of the facility were (1) scale-up and study experimental results at a pre-commercial-scale; (2) assess technical and financial feasibility and improve these technologies before transfer to commercial-scale; (3) adapt technology to other fish species. In the hatchery, a semi-intensive, green water strategy is used for larval rearing, and rotifers are produced using a high density, intensive production technique. An intensive, tank-based nursery is used to study juvenile husbandry. Although the main objective of the facility is to package technology, the annual production capacity for juvenile to supply to industrial partners is about 160,000-200,000 one-gram juveniles produced in three or four rearing cycles. Seawater intake is based on a sand and gravel prefiltered system and two 30 hp seawater radial pumps, each with the capacity to fulfill the whole system requirements (500 gpm, 31 L/s, sustained flowrate). Most of the water is delivered directly to the broodstock and nursery areas after sand and cartridge filtration and a UV lamp (<=60,000 [mu]W s/cm2), and the rest is used to fill four 25 m3 high density polyethylene (HDPE) storage tanks. From the storage tanks, the seawater is directed through three pressurized sand filters and a series of high capacity cartridge filters (16 [mu]m). For live feed production and larval rearing, water is further filtered using line cartridge filters (as small as 0.22 [mu]m) and a continuous-flow UV lamp (<=60,000 [mu]W s/cm2). There is a freshwater system for 60 m3/day and an air distribution system that includes three 10 hp blowers, each with the required capacity for the entire facility. The broodstock areas have 40 tanks (0.6-50 m3) with a total capacity of 410 m3. Initially there are six 3 m3 larval rearing tanks and in a second stage a 40 m3 mesocosms tank facility will be added. The indoor (160 m2) live food culture facility is capable of a daily production of about 8 m3 of four microalgae species (1-40 x 106 cells/ml, depending on the species), 2.5 x 109 enriched rotifers, 6 x 108 enriched Artemia metanauplii and 4 x 107 copepods.
Keywords: Pilot-scale; Hatchery; Design; Marine fishes; Mexico

William D. Dar, Stephen J. Twomlow, Managing agricultural intensification: The role of international research, Crop Protection, Volume 26, Issue 3, Weed Science in Time of Transition, March 2007, Pages 399-407, ISSN 0261-2194, DOI: 10.1016/j.cropro.2006.04.029.
(http://www.sciencedirect.com/science/article/B6T5T-4M4KJY0-1/2/95b4d0475d7b8aa01a5a8dfd87b04c76)
Abstract:
Over the next 20-25 yr, global food demand is expected to increase by around 50%, largely due to demand in developing countries. The challenge is to increase production without damaging the natural resource base. Various technologies for integrated natural resource management (INRM) have been developed, but adoption has been poor, for various reasons--technical, socio-economic, and institutional.
To date a great deal of past work has focused at the plot and farm level, with little farmer involvement in developing the research agenda. Work needs to be extrapolated to more sites, with greater farmer involvement in the research process, in order to answer the key question: `Under what conditions will rural households be encouraged to reinvest in their agroecosystems?'
Encouraging such investment involves several challenges: improving returns from such investments; creating market access for smallholder farmers; improving research-extension-farmer

linkages; developing enabling policies on soil, water and biodiversity; integration of livestock-wildlife-crop systems; development of drought mitigation strategies; capacity building; better information flow; and a clearer gender perspective in research and training.
A large body of successful INRM research is available from many countries in the West and in Latin America. Unfortunately much of this work is reaching sub-Saharan Africa only now, and its appropriateness to the needs of the African smallholder farmer requires verification. This paper shares some of the experiences of the Consultative Group on International Agricultural Research (CGIAR), International Agricultural Research Centers (IARCs) in Africa, particularly the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Reference is made to some specific technologies and some limited successes with small-scale farmers in Africa.
Keywords: Integrated natural resource management; Agricultural development; Sub-Saharan Africa; Soil fertility; Participatory research

Annik Dollacker, Claire Rhodes, Integrating crop productivity and biodiversity conservation pilot initiatives developed by Bayer CropScience, Crop Protection, Volume 26, Issue 3, Weed Science in Time of Transition, March 2007, Pages 408-416, ISSN 0261-2194, DOI: 10.1016/j.cropro.2005.06.014.
(http://www.sciencedirect.com/science/article/B6T5T-4MV1NS0-1/2/45ef7df1e5582e65fbde44fa32651b26)
Abstract:
Wildlife habitat loss driven by human activities, including conversion of land to agriculture, represents a major threat to biodiversity. Agricultural technologies, for example, irrigation, mechanization, enhanced seeds, crop protection and nutrition products contribute to productivity increases on land already cultivated and, therefore, play a role in preventing further land conversion to agriculture. However, such technologies must be adapted and employed within the context of locally appropriate land management strategies that take an integrated approach to achieving agricultural production, rural livelihoods and biodiversity conservation goals.
This paper was developed for presentation at a workshop on `Conservation Technologies for Sustainable Agriculture', held during the 4th International Weed Society Congress, [4th International Weed Society Congress, Durban, South Africa, 19-25 June 2004.http://www.olemiss.edu/orgs/iws/4intlweedcong.htm>.], It highlights the potential roles a plant science company can play in addressing the challenge of jointly achieving crop productivity and biodiversity conservation objectives. These relate to activities that integrate biodiversity conservation objectives into technology research and development (R&D) of crop protection products and into land management approaches. Three pilot initiatives developed by Bayer CropScience in Brazil, Guatemala and the UK in collaboration with a variety of local stakeholders illustrate how conservation objectives can be embedded in land management practices that sustainably enhance agricultural productivity and profitability, simultaneously addressing food security and biodiversity conservation challenges.
Bayer CropScience, a subsidiary of Bayer AG, is a market leader in the areas of crop protection, non-agricultural pest control, seeds and plant biotechnology. The company has a global workforce of about 19,000 and is represented in more than 120 countries.
Keywords: Biodiversity; Agricultural technologies; Integrated crop management; Integrated pest management; Pesticides; Conservation tillage; Ecoagriculture

Michio Ito, Tetsuo Matsumoto, Marco A. Quinones, Conservation tillage practice in sub-Saharan Africa: The experience of Sasakawa Global 2000, Crop Protection, Volume 26, Issue 3, Weed Science in Time of Transition, March 2007, Pages 417-423, ISSN 0261-2194, DOI: 10.1016/j.cropro.2006.06.017.
(http://www.sciencedirect.com/science/article/B6T5T-4M33VPN-B/2/5fe1cd105f996f4d584f33abac2c2c31)

Abstract:
Sasakawa Global 2000 (SG 2000), an international non-governmental organization (NGO) for assisting small-scale farmers in sub-Saharan African countries to increase staple food crop production, introduced conservation tillage (CT) technology to Ghana in 1993. In collaboration with the national Crop Research Institute (CRI) and a private company, SG 2000 has developed a `no-till with mulch' cultivation system especially well suited to small-scale farmers. Farmers obtained 3-6 t/ha of maize compared with 1 t/ha by traditional methods. The CT technology package, together with herbicides and fertilizers, offers several advantages such as increased organic matter on the soil surface, soil erosion prevention and, in the long run, restoration of soil fertility. Farmers can reduce labor costs, save time and expand the size of the cultivated area at little cost. CT is profitable even when using inputs such as herbicides, improved seed and fertilizers. Widely adopted by a large number of small farmers in Ghana, the practice has been spreading to Mozambique, Ethiopia, Malawi and other countries where SG 2000 is in operation. By using CT technology, farmers do not need to plough the fields for seed bed preparation, and by applying a herbicide before planting, farmers are relieved from weeding, which is usually done manually. Weeds killed by the herbicide then dry up and become part of the mulch cover. This study proves that CT technology is a vital tool for promoting agricultural development in a sustainable manner. Examples of CT practice in selected SG 2000 country projects are discussed and the impact of CT on various aspects is elaborated.
Keywords: Conservation tillage; Sub-Saharan Africa; Sasakawa Global 2000; Herbicides

Raj Gupta, Ashok Seth, A review of resource conserving technologies for sustainable management of the rice-wheat cropping systems of the Indo-Gangetic plains (IGP), Crop Protection, Volume 26, Issue 3, Weed Science in Time of Transition, March 2007, Pages 436-447, ISSN 0261-2194, DOI: 10.1016/j.cropro.2006.04.030.
(http://www.sciencedirect.com/science/article/B6T5T-4M93692-1/2/d3c90aec5fe6f6acb92ee485b8cb42d9)
Abstract:
Rice and wheat are the staple food crops occupying nearly 13.5 million hectares of the Indo-Gangetic plains (IGP) of South Asia covering Pakistan, India, Bangladesh and Nepal. These crops contribute more than 80% of the total cereal production and are critically important to employment and food security for hundreds of millions of rural families. The demand for these two cereals is expected to grow between 2% and 2.5% per annum until 2020, requiring continued efforts to increase productivity while ensuring sustainability. Starting from the 1960s, expansion of area and intensification of rice-wheat productions system based on the adoption of Green Revolution (GR) technologies, incorporating the use of high-yielding varieties, fertilizers and irrigation, led to increased production and productivity of both these crops. However, continued intensive use of GR technologies in recent years has resulted in lower marginal returns and, in some locations to salinization, overexploitation of groundwater, physical and chemical deterioration of the soil, and pest problems. This paper presents findings from recent research on resource conservation technologies involving tillage and crop establishment options that are enabling farmers to sustain productivity of intensive rice-wheat systems. Field results show that the resource conserving technologies, an exponent of conservation agriculture, improve yields, reduce water consumption, and reduce negative impacts on the environmental quality. The paper considers contributions of innovative inter-institutional collaboration in international agricultural research and socio-economic changes in the IGP countries that led to rapid development and adoption of these technologies by farmers.
Keywords: Crop establishment; RCT; Rice; Tillage; Water; Wheat

Hajime Fujii, Buxiang Sun, Hiroshi Nishioka, Aya Hirose, Okezie I. Aruoma, Evaluation of the safety and toxicity of the oligomerized polyphenol Oligonol, Food and Chemical Toxicology,

Volume 45, Issue 3, March 2007, Pages 378-387, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.08.026.
(http://www.sciencedirect.com/science/article/B6T6P-4KX00RG-1/2/5724e58ba277c77dd498236e183adfe5)
Abstract:
Oligonol(R) is an optimised phenolic product containing catechin-type monomers and lower oligomers of proanthocyanidin that emanate from a technology process which converts polyphenol polymers into oligomers. In a single dose toxicity study administration of Oligonol (2000 mg/kg bw) by gavage for 4 weeks was found to be safe with no side effects (such as abnormal behavior and alopecia). Body weight gain and food consumption were within normal range. Oligonol had no observed toxicity at the dose (1/25 of LD50) administered for 6 months. This suggests that Oligonol is safe at repeated human intakes of Oligonol in doses lower than 200 mg/day. The highest dose used in this study is equal to 12 g daily for an adult man with 60 kg body weight. The LD50 was calculated to be 5.0 g/kg body weight (95% confidence limit: 3.5-6.4 g/kg). Studies conducted on 30 healthy volunteers consuming Oligonol at doses of 100 mg/day and 200 mg/day for 92 days showed good bioavailability. The biochemical parameters attesting to liver and kidney functions as well as the hematological parameters were within the normal ranges. The potential of Oligonol to induce gene mutation (a reverse mutation test) was tested using Salmonella typhimurium TA98, TA100, TA104, TA1535, TA153 and Escherichia coli WP2uvrA. Oligonol was not mutagenic to the tester strains. The lack of toxicity supports the potential use of Oligonol as a food or dietary supplement and for use as an additive in pharmaceutical and cosmetological applications.
Keywords: Oligonol; Catechin; Low molecular proanthocyanidins; Flavonoids; Functional foods; Safety evaluation; Toxicology; Mutagenicity; Cosmetological applications; Pharmaceutical additives

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

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.

Susanne Schilling, Thorsten Alber, Stefan Toepfl, Sybille Neidhart, Dietrich Knorr, Andreas Schieber, Reinhold Carle, Effects of pulsed electric field treatment of apple mash on juice yield and quality attributes of apple juices, Innovative Food Science & Emerging Technologies, Volume 8, Issue 1, March 2007, Pages 127-134, ISSN 1466-8564, DOI: 10.1016/j.ifset.2006.08.005.
(http://www.sciencedirect.com/science/article/B6W6D-4M3BC9R-1/2/ad0a4a5778acb0e4d780a3d8caa39230)
Abstract:
The influence of apple mash treatment with pulsed electric fields (PEF) on yield and quality attributes of the resulting cloudy juices were investigated. Apple juice was produced at laboratory scale (400 g apples per lot) by mash treatment with pulsed electric fields at three different field intensities (1, 3, 5 kV/cm, n = 30 pulses) and manual pressing at room temperature. The juices were compared with untreated control juices of the same mash and with a juice after pectolytic mash treatment. Relative to the control samples, juice yield increased with increasing field intensities. The overall composition as described by pH, total soluble solids, total acidity, density, contents of sugar, malic acid and pectin, respectively, as well as the nutritive value with respect to polyphenol contents and antioxidant capacities (TEAC, FRAP, DPPH) of the PEF-treated apple juices did not significantly differ from the controls.Industrial relevance
This paper addresses the composition of apple juice after mash treatment applying pulsed electric fields and maceration enzymes, respectively. Since substantial equivalence of products derived from novel technologies, such as PEF, relative to their conventionally produced counterparts is required according to European food law, this aspect is of great relevance, especially for

commercialisation of fruit juices based on PEF technology. Furthermore, the nutritional value of juices produced at different pulsed electric field activities is of relevance for their marketing.
Keywords: Pulsed electric fields (PEF); Apple juice; Antioxidant capacity; Polyphenolics; Juice extraction

Robert Ovetz, The bottom line: An investigation of the economic, cultural and social costs of high seas industrial longline fishing in the Pacific and the benefits of conservation, Marine Policy, Volume 31, Issue 2, March 2007, Pages 217-228, ISSN 0308-597X, DOI: 10.1016/j.marpol.2006.09.002.
(http://www.sciencedirect.com/science/article/B6VCD-4MFKK9H-1/2/80130f5b868ec6bf008e5d32cf827df1)
Abstract:
High sea industrial longline fishing can be understood as a case study of the cultural, economic, environmental and social impacts of unsustainable fishing technology. While much attention has been attributed to the impact of industrial longlines on the marine ecosystem, little is known about the impact of longline fishing on local food security, employment, cultural belief systems and traditions, revenue generation from marine tourism and climate change. New data demonstrate that the contributions of Marine Protected Areas, marine tourism and recreational fishing to local coastal economies dwarf the contributions of longline fishing. When combined with the impact of overfishing on coastal fishing communities and fish consumers, policies promoting sustainable fisheries must be expanded to take these other factors into account along with issues of biodiversity.
Keywords: Longline fishing; Sea turtles; Recreational fishing; Marine tourism

D.G. Mercer, Antonio Lopez-Gomez and Gustavo V. Barbosa-Canovas, Food plant design, Food Science and Technology Vol. 143, CRC Press, Taylor and Francis Group (2005) ISBN 1-57444-602-9 416 pages, price $149.95 (U.S.).., Trends in Food Science & Technology, Volume 18, Issue 3, March 2007, Pages 167-168, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.08.002.
(http://www.sciencedirect.com/science/article/B6VHY-4M0S34B-2/2/a2d2c9eec4669eecce4bbf1c165b7b95)

Guimei Yang, Baolong Bao, Eric Peatman, Huirong Li, Lubiao Huang, Daming Ren, Analysis of the composition of the bacterial community in puffer fish Takifugu obscurus, Aquaculture, Volume 262, Issues 2-4, 28 February 2007, Pages 183-191, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.11.031.
(http://www.sciencedirect.com/science/article/B6T4D-4MH7TMT-2/2/85dcc1ede3f5b7bd58a2b8626f4ba451)
Abstract:
The food chain has been postulated as one pathway for tetrodotoxin (TTX)-producing bacteria to enter into fish. However, the background composition of the bacterial community in puffer fish is unclear. Using 16S rDNA PCR denaturing gradient gel electrophoresis (PCR-DGGE) technology, we investigated the composition of bacterial communities in the skin, intestines, and TTX-accumulating organs (ovary, liver) of the striped puffer fish Takifugu obscurus. A total of 38 species of different culture-independent bacteria were isolated and classified according to phylogenetic analysis. Of these species, those belonging to the class [gamma]-Proteobacteria dominated the microbial community in the puffer fish, while others belonged to the group of low DNA G + C content, Cytophaga-Flavobacterium-Bacteroides (CFB) group, [alpha]-Proteobacteria, [beta]-Proteobacteria, [epsilon]-Proteobacteria and Spirochaetales. Gram positive bacteria of the group of low DNA G + C content were seen as the dominant component in the intestine, while [gamma]-Proteobacteria was the dominant group in the skin or TTX-accumulating organs. The TTX-accumulating organs were found to contain bacteria from all TTX-producing genera reported

previously. We also observed large differences in the bacterial assemblages in the intestines of fish fed natural and artificial diets.
Keywords: Takifugu obscurus; 16S rDNA; Denaturing Gradient Gel Electrophoresis (DGGE); Bacterial composition; Intestine; Skin; TTX-accumulating organ

N. Martinez-Perez, S.J. Cherryman, G.C. Premier, R.M. Dinsdale, D.L. Hawkes, F.R. Hawkes, G. Kyazze, A.J. Guwy, The potential for hydrogen-enriched biogas production from crops: Scenarios in the UK, Biomass and Bioenergy, Volume 31, Issues 2-3, February-March 2007, Pages 95-104, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2006.07.003.
(http://www.sciencedirect.com/science/article/B6V22-4M33VXM-1/2/dd8066d99c71bc9537171db45c770c1e)
Abstract:
There is increasing international interest in developing low carbon technologies to provide hydrogen renewably. Hydrogen can be produced through dark anaerobic fermentation using carbohydrate-rich substrates, and methane can be produced in a methanogenic second stage. The suitability of a range of crops for hydrogen and methane production in the UK is examined, using selection criteria including yield, harvest window and composition of the crops. The annual potential for hydrogen and methane production is calculated using the selected crops, taking into account the energy required to grow and harvest the biomass and run the process. The fermentable energy crops fodder beet, forage maize, sugar beet and rye grass were identified as the most suitable substrates for this farm-scale process. A conservative estimate of the amount of agricultural land in the UK excluding permanent grassland not already used for food production or energy crops (currently unused 'set-aside' land) has been made (294,960 ha). If this was used to grow a rotation of the selected crops, 9.6 TW h net energy could be produced per year. This equates to electrical power for 2.2 million homes in the UK annually and a reduction of CO2 emissions by over 2.3 million tones per annum in the UK.
Keywords: Sustainable hydrogen production; Fermentation; Biomass; Energy crop

Jerome Ballet, The buffet syndrome, midday menu and terry towels, Ecological Economics, Volume 60, Issue 4, 1 February 2007, Pages 685-687, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2006.10.006.
(http://www.sciencedirect.com/science/article/B6VDY-4MD9G82-3/2/473392f4199ddc08f3faf99b89dd1850)
Abstract:
In a recent article, Bazin et al. (Bazin, D., Ballet, J., Touahri, D., 2004. Environmental responsibility versus taxation. Ecological Economics 49 (2), 129-134.) argue that taxation produces a crowding out effect on responsible behaviours. This crowding out effect is linked to the buffet syndrome, e.g. wherein an environmental tax is like a food buffet in that when you pay you could consume as much as you want. This article means to offer a perspective on this syndrome. It shows that this syndrome comes into play only in certain circumstances and that explicit policies may avoid it. In particular, the development of clean goods and technologies may avoid the buffet syndrome.
Keywords: Taxation; Responsibility; Buffet syndrome; Crowding-out

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

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

Boru Douthwaite, Steffen Schulz, Adetunji S. Olanrewaju, Jim Ellis-Jones, Impact pathway evaluation of an integrated Striga hermonthica control project in Northern Nigeria, Agricultural

Systems, Volume 92, Issues 1-3, January 2007, Pages 201-222, ISSN 0308-521X, DOI: 10.1016/j.agsy.2006.03.007.
(http://www.sciencedirect.com/science/article/B6T3W-4K5JBXY-1/2/a3b9f2ab2db40448e0fc6092c939ccc2)
Abstract:
This paper evaluates a project that developed and introduced integrated Striga control (ISC) in Northern Nigeria. Adoption of ISC increased from 44 participating farmers in four pilot areas to more than 500 farmers in 16 villages and hamlets in three seasons. On average, farmers adopted 3.25 different Striga control options from a basket of six 'best bets'. Resource-poor and -medium farmers were more likely to adopt than resource-rich ones. Adopting farmers enjoyed livelihood improvements, largely through selling ISC soybean. Women in most adopting households benefited through selling food products based on soybean. Adoption of ISC can be attributed to four factors: (1) farmer-field-school-type training that explained how the technologies worked; (2) incorporation of at least one technology in the ISC package that gave quick benefits to sustain farmer interest in adopting and learning other components whose effects took longer to become evident; (3) allowance for farmer experimentation and adaptation to local conditions; and, (4) use of a monitoring and evaluation component that identified and incorporated farmer modifications to continually improve the ISC package. These principles are likely to be valid for research and extension approaches for similar integrated natural resource management (INRM). Impact pathway evaluation methodology used for the evaluation helped give the project a greater impact focus; helped design and reporting of the evaluation; and, by identifying early adoption pathways, has provided a firm basis for any future ex post impact assessment of ISC in Northern Nigeria.
Keywords: Impact assessment; Natural resource management (NRM); Integrated pest management (IPM)

Helder J. Vila Real, Antonio J. Alfaia, Antonio R.T. Calado, Maria H.L. Ribeiro, High pressure-temperature effects on enzymatic activity: Naringin bioconversion, Food Chemistry, Volume 102, Issue 3, 2007, Pages 565-570, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.05.033.
(http://www.sciencedirect.com/science/article/B6T6R-4KF1HXC-3/2/d43ed1c2ed9d3a855b352a3cad20a80e)
Abstract:
Initially exploited in chemistry and physics, high-pressure technology has gained importance in various fields.
Flavonoids, namely naringin and naringenin, from citrus, are functional chemicals with important properties in the fields of healthcare, food and agriculture. Naringin, the principal bitter flavonone glycoside and the primary bitter component in grapefruit juice, can be hydrolysed by naringinase into tasteless naringenin.
The temperature of 303 K was ideal for maximizing the activity of the naringinase at 160 MPa when compared to atmospheric pressure. The pressure had a positive effect on the reaction rate, with a value of -15.0 +/- 1.8 cm3 mol-1 for the activation volume.
Kinetic parameters, kM and Vmax for naringinase were evaluated, the maximum initial rate at 160 MPa (Vmax = 2.7 mM min-1) was higher than that at atmospheric pressure (Vmax = 0.06 mM min-1). This is a promising result for future application of enzymatic hydrolysis of naringin at high pressure, in the citrus juice industry.
Keywords: Naringinase; Naringin; High-pressure; Temperature; Kinetics parameters

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

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

Jin-Hong Wu, Zhang Wang, Shi-Ying Xu, Preparation and characterization of sericin powder extracted from silk industry wastewater, Food Chemistry, Volume 103, Issue 4, 2007, Pages 1255-1262, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.10.042.
(http://www.sciencedirect.com/science/article/B6T6R-4MNYK1R-2/2/b36439e6d5477cba09df6c1f0723c1f6)
Abstract:

In this study, we developed a new effective technology for the extraction of sericin from silk wastewater. Sericin was extracted with 75% (v/v) ethanol to obtain crude powder. The chemical composition of sericin powder, including protein, sugar, ash, and amino acid, was assayed in detail. The molecular weight distribution of sericin was also investigated by gel filtration chromatography, sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE), and high performance liquid chromatography (HPLC) analytical methods. The results suggested that sericin represented a family of proteins with wide-ranging molecular weight distribution. The conformation changed in the course of ethanol precipitation was studied by circular dichroism (CD) analysis. Data implied that the major conformation of sericin protein was random coil, which decreased slightly after being treated with ethanol, and the appearance of [beta]-Turn conformation maybe associated with the packing of molecular chains induced by ethanol. Furthermore, sericin was found to inhibit tyrosinase activity when chlorogenic acid was used as a substrate, and had obvious radical scavenging effects with the 2.2-diphenyl-1-picryl-hydrazil (DPPH) assay. Result suggested that sericin might be a valuable ingredient for food.
Keywords: Sericin; Molecular weight; Circular dichroism; Tyrosinase; Radical scavenging activity; IC50

Chien-Chun Huang, Woan-Ching Chen, Chiun-C.R. Wang, Comparison of Taiwan paddy- and upland-cultivated taro (Colocasia esculenta L.) cultivars for nutritive values, Food Chemistry, Volume 102, Issue 1, 2007, Pages 250-256, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2006.04.044.
(http://www.sciencedirect.com/science/article/B6T6R-4KB14SB-3/2/fdc117ae2ddb78dddd38748f45bb4d03)
Abstract:
Taro (Colocasia esculenta L.), an important food staple for millions of people, is grown exclusively in the tropical and semitropical regions of the world. It is cultivated mainly in developing countries, rarely on large plantations but on small farms with little technology. The purpose of this study was to investigate the effect of cultivars and field preparations of taro corms on the nutrient content and protein nutritional quality. Three local cultivars of taro corms were grown by paddy and upland cultivation in Taiwan. The results showed that taro contained 63.6%-72.4% moisture, and upland-cultivated taro corms retained a higher moisture content compared to paddy taro. Results revealed that taro corms also contained 21.1%-26.2% starch and 1.75%-2.57% crude protein and provided total energy in the range of 97.1-118.3 kcal/100 g fresh taro. Taro corms had reasonably high contents of potassium and magnesium, whose ranges were 2251-4143 and 118-219 mg/100 g dry matter, respectively. Upland-cultivated taro tended to have higher mineral content than paddy taro. Taro corms are moderately good sources of water-soluble vitamins, such as thiamin, riboflavin and ascorbic acid, compared to other tropical roots. A higher soluble sugar content in upland-cultivated taro corms was found than in paddy taro. The cultivar Mein contained higher soluble fibre levels than two other cultivars. Total oxalate and phytic acid levels of taro corms were in the range of 234-411 and 139-169 mg/100 g dry matter, respectively, which included 60%-75% of water-soluble oxalate. Essential amino acid contents of taro proteins from both paddy and upland cultivation were fairly similar to the FAO reference pattern, except for the contents of sulfur-containing amino acids, tryptophan, and histidine.
Keywords: Colocasia esculenta; Taro corms; Paddy and upland cultivation; Nutrient content; Protein nutritional quality

Maria Ros-Chumillas, Marcos Egea-Cortines, Antonio Lopez-Gomez, Julia Weiss, Evaluation of a rapid DNA extraction method to detect yeast cells by PCR in orange juice, Food Control, Volume 18, Issue 1, January 2007, Pages 33-39, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.08.004.
(http://www.sciencedirect.com/science/article/B6T6S-4H5MYGY-1/2/246d04c0a301338d1d7e4440a9b9d4e2)

Abstract:
Yeasts are the main causes of spoilage in pasteurized orange juice. Whereas detection by plate counting techniques is too slow to allow appropriate intervention measures, PCR reaction offers a rapid alternative, but it can be inhibited by components of food samples. We developed a DNA extraction method directly from orange juice for rapid yeast detection by PCR amplification of the rRNA internal transcribed spacers including the 5.8S rRNA gene at a detection limit of 103 cfu/ml juice sample. We show that it is possible to reduce detection time and improve detection rate of yeasts in orange juice by using a simple glass bead disruption procedure in connection with silica absorption and amplification technology.
Keywords: Saccharomyces cerevisiae; DNA extraction; PCR

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

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

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

H.P.S. Kochhar, B.R. Evans, Current status of regulating biotechnology-derived animals in Canada--animal health and food safety considerations, Theriogenology, Volume 67, Issue 1, IETS 2007 Pre-Conference Symposia, IETS 2007, 1 January 2007, Pages 188-197, ISSN 0093-691X, DOI: 10.1016/j.theriogenology.2006.09.021.
(http://www.sciencedirect.com/science/article/B6TCM-4MBC4W1-1/2/42169db8c640b29659f8fce08aca4bcb)
Abstract:
Development of an effective regulatory system for genetically engineered animals and their products has been the subject of increasing discussion among researchers, industry and policy developers, as well as the public. Since transgenesis and cloning are relatively new scientific techniques, transgenic animals are `novel' organisms for which there is limited information. The issues associated with the regulation of transgenic animals pertain to environmental impact, human food safety, animal health and welfare, trade and ethics. It is a challenge for the developers to prove the safety of the products of biotechnology-derived animals and also for regulators to regulate this increasingly powerful technology with limited background information. In principle, an effective regulatory sieve should permit safe products while forming a formidable barrier for those posing an unacceptable risk. Regulatory initiatives for biotechnology-derived animals and their products should be able to ensure high standards for human and animal health, a sound scientific basis for evaluation; transparency and public involvement, and maintenance of genetic diversity. This review proposes a regulatory regime that is based on scientific risk based assessment and

approval of products or by-products of biotechnology-derived animals and its application in context to Canadian regulations.
Keywords: Regulation; Animal health; Food safety; Biotechnology-derived animals; Safety assessments

Larisa Rudenko, John C. Matheson, The US FDA and animal cloning: Risk and regulatory approach, Theriogenology, Volume 67, Issue 1, IETS 2007 Pre-Conference Symposia, IETS 2007, 1 January 2007, Pages 198-206, ISSN 0093-691X, DOI: 10.1016/j.theriogenology.2006.09.033.
(http://www.sciencedirect.com/science/article/B6TCM-4M51F6C-2/2/575fa014da23bd699dbe708fc9b78030)
Abstract:
The Food and Drug Administration's (FDA's) Center for Veterinary Medicine issued a voluntary request to producers of livestock clones not to introduce food from clones or their progeny into commerce until the agency had assessed whether production of cattle, swine, sheep, or goats by somatic cell nuclear transfer (SCNT) posed any unique risks to the animal(s) involved in the process, humans, or other animals by consuming food from those animals, compared with any other assisted reproductive technology (ART) currently in use. Following a comprehensive review, no anomalies were observed in animals produced by cloning that have not also been observed in animals produced by other ARTs and natural mating. Further systematic review on the health of, and composition of meat and milk from, cattle, swine, and goat clones and the progeny of cattle and sheep did not result in the identification of any food-consumption hazards. The agency therefore concluded that food from cattle, swine, and goat clones was as safe to eat as food from animals of those species derived by conventional means. The agency also concluded that food from the progeny of the clone of any species normally consumed for food is as safe to eat as those animals. The article also describes the methodology used by the agency to analyze data and draw these conclusions, the plans the agency has proposed to manage any identified risks, and the risk communication approaches the agency has used.
Keywords: Livestock cloning; Risk assessment; Food; FDA

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.

H.A. Webber, C.A. Madramootoo, M. Bourgault, M.G. Horst, G. Stulina, D.L. Smith, Water use efficiency of common bean and green gram grown using alternate furrow and deficit irrigation, Agricultural Water Management, Volume 86, Issue 3, 16 December 2006, Pages 259-268, ISSN 0378-3774, DOI: 10.1016/j.agwat.2006.05.012.
(http://www.sciencedirect.com/science/article/B6T3X-4KCPV7D-1/2/dfed836e5364c6f4a982f1b6c61eca92)

Abstract:
The pressure on water resources in the Fergana Valley of Central Asia is expected to increase, as population and industrial activity grow. Increasing water use efficiency (WUE) associated with crop production is a way for arid and semi-arid areas to increase their agricultural production where there is little or no prospect for expansion of water resources. The WUE of two water saving irrigation technologies were evaluated for two legumes, grown as a second crop, in the Fergana Valley of Uzbekistan. Conventional and alternate furrow irrigation and three irrigation schedules were used to irrigate food legumes in a field experiment conducted over two growing seasons (2003 and 2004) after winter wheat harvest. The treatments consisted of factorial combinations of three factors, organized following a split-plot randomized complete block design with four blocks: three irrigation schedules (recommended, moderate and severe depletions) as the main plot factor and combinations of the two irrigation strategies (conventional and alternate furrow irrigation) and two crops (green gram and common bean) as the two sub-plot treatment. The WUE was quantified for commercial yield, above ground biomass and root biomass per unit of water consumed by the crop. The results of this study indicate the WUE for both commercial yield and biomass were approximately twice as high for green gram as bean. Conversely, the water use efficiency for root biomass in bean (0.15 kg m-3) was slightly higher than in green gram (0.13 kg m-3). WUE increased in green gram when deficit irrigation or alternate furrow irrigation were practiced, whereas it remained constant in bean for all treatment combinations. These results suggest that common bean is not as well suited to water scarce conditions as green gram. Alternate furrow irrigation and deficit irrigation are appropriate methods to increase WUE, allowing application of less irrigation water, particularly, for green gram production.
Keywords: Alternate furrow irrigation; Common bean (Phaseolus vulgaris); Green gram (Vigna radiata); Irrigation scheduling; Regulated deficit irrigation; Water use efficiency; Fergana Valley of Uzbekistan

A. Kadir, R.S. Kundu, A. Milstein, M.A. Wahab, Effects of silver carp and small indigenous species on pond ecology and carp polycultures in Bangladesh, Aquaculture, Volume 261, Issue 3, 1 December 2006, Pages 1065-1076, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.09.010.
(http://www.sciencedirect.com/science/article/B6T4D-4KX00NY-3/2/dbd121726e9f75a32e98c2c7ea148291)
Abstract:
A sustainable semi-intensive pond aquaculture technology including major carp species as cash-crop and small indigenous fish species (SIS) as food for the farmers' families is being optimized in Bangladesh. The inclusion of silver carp (Hypophthalmichthys molitrix), a cheap large species affordable by poor farmers, is now being considered. As part of a study on the effects of this filter feeder on polycultures including the large carps rohu (Labeo rohita), catla (Catla catla) and common carp (Cyprinus carpio) and the SIS punti (Puntius sophore) and mola (Amblypharyngodon mola), an experiment was carried out to test the effects of silver carp and of each SIS species on the growth, survival and yield of the large and small fish and on pond ecology.
The ecology of the ponds was dominated by changes in time, strongly related to the development of a surface plankton scum at the beginning of the culture season and weather conditions. The surface scum increased decomposition processes and decreased algal development in the water body, promoted photosynthesis and ammonium release and reduced nitrification. Over those effects, the presence of silver carp in the ponds decreased algal biomass through grazing and promoted nitrification providing and resuspending particles in the water column. These effects were also produced by mola, but were evident only in the absence of silver carp. Punti stirring on the pond bottom increased nutrient flow from the sediments into the water column and promoted nitrification, but were also evident only in the absence of silver carp.

The addition of 10 silver carp over the 99 large carps stocked in the 100 m2 fishponds did not affect punti and mola reproduction in the ponds, negatively affected rohu and catla growth and yield by about 20-25% but not their survival, did not affect common carp performance, reduced punti harvested biomass by 10%, reduced mola performance by about 50%, and silver carp's own biomass increased total yield and total income in about 20% each. The addition of 250 mola or punti to the large carp polycultures did not affect the performance of any of the large carps. The decreased income from selling the more expensive large carps was more than compensated by that obtained from silver carp, which increased total income by 13-24% as compared to the corresponding treatments without silver carp. This allows the option to the farmer of selling part of the silver carp to complete the cash income that would have been obtained from large carps only if silver carp would not be stocked, and consume the rest with the family.
Keywords: Catla; Food web; Mola; Polyculture; Punti; Rohu; Silver carp; SIS small indigenous species

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

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

Yael Danin-Poleg, Lilach Somer, Lyora A. Cohen, Eran Diamant, Yniv Palti, Yechezkel Kashi, Towards the definition of pathogenic microbe, International Journal of Food Microbiology, Volume 112, Issue 3, 1 December 2006, Pages 236-243, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.04.010.
(http://www.sciencedirect.com/science/article/B6T7K-4KNM9V5-1/2/43f780769248871f8f8b031e105c4597)
Abstract:
Identification and typing of spoilage and pathogenic microorganisms have become major objectives over the past decade in microbiology. In food, strain typing is necessary to ensure food safety and for linking cases of foodborne infections to suspected items. Recent advances in molecular biology have resulted in the development of numerous DNA-based methods for discrimination among bacterial strains. Here, we present the use of Simple Sequence Repeats (SSR, or Microsatellites) for bacterial typing. SSRs are a class of short DNA sequence motifs that are tandemly repeated at a specific locus. Computer-based screen of the complete genomic DNA sequences of various prokaryotes showed the existence of tens of thousands well distributed SSR tracts. Mono Nucleotides Repeats (MNRs) are the majority of SSR tracts in bacteria, therefore selected MNR loci were analyzed for variation among strains belonging to three bacterial species: Escherichia coli, Listeria monocytogenes and Vibrio cholerae. High levels of polymorphism in the number of repeats was observed. The finding that most of the MNR tracts are variable in bacterial genomes, but stable at the strain level, allows the use of MNRs for bacterial strains identification. The variation in MNR tracts enables the separation between virulent and non-virulent strain groups and further discriminates among bacterial isolates, in the three tested bacterial species. The uncovered MNR polymorphism is important as a genome-wide source of variation, both in practical applications (e.g. rapid strain identification) and in evolutionary studies. This multi-locus MNR strategy could be applied for high throughput bacterial typing by assigning an 'identity number' for each strain based on MNR variations. The developed typing technology should include the fingerprint database for large bacterial strain collections and a high throughput scanner. This accurate and rapid tool can have a major role in decreasing the incidences of food-related outbreaks and will contribute to limit epidemics.
Keywords: Bacterial typing; Simple sequence repeats; Microsatellite; Mononucleotide repeats; Listeria monocytogenes; Escherichia coli; Vibrio cholerae

David J. Ecker, Jared J. Drader, Jose Gutierrez, Abel Gutierrez, James C. Hannis, Amy Schink, Rangarajan Sampath, Lawrence B. Blyn, Mark W. Eshoo, Thomas A. Hall, Maria Tobarmosquera, Yun Jiang, Kristin A. Sannes-Lowery, Lendell L. Cummins, Brian Libby, Demetrius J. Walcott, Christian Massire, Raymond Ranken, Sheri Manalili, Cristina Ivy, Rachael Melton, Harold Levene, Vanessa Harpin, Feng Li, Neill White, Michael Pear, Joseph A. Ecker, Vivek Samant, Duane Knize, David Robbins, Karl Rudnick, Fred Hajjar, Steven A. Hofstadler, The Ibis T5000 Universal Biosensor: An Automated Platform for Pathogen Identification and Strain Typing, Journal of the Association for Laboratory Automation, Volume 11, Issue 6, December 2006, Pages 341-351, ISSN 1535-5535, DOI: 10.1016/j.jala.2006.09.001.
(http://www.sciencedirect.com/science/article/B75DF-4MK1DKC-7/2/2aa286cd30f07668cc2d53bb217a1adf)
Abstract:
We describe a new approach to the sensitive and specific identification of bacteria, viruses, fungi, and protozoa based on broad-range PCR and high-performance mass spectrometry. The Ibis T5000 is based on technology developed for the Department of Defense known as T.I.G.E.R. (Triangulation Identification for the Genetic Evaluation of Risks) for pathogen surveillance. The technology uses mass spectrometry-derived base composition signatures obtained from PCR amplification of broadly conserved regions of the pathogen genomes to identify most organisms present in a sample. The process of sample analysis has been automated using a combination of

commercially available and custom instrumentation. A software system known as T-Track manages the sample flow, signal analysis, and data interpretation and provides simplified result reports to the user. No specialized expertise is required to use the instrumentation. In addition to pathogen surveillance, the Ibis T5000 is being applied to reducing health care-associated infections (HAIs), emerging and pandemic disease surveillance, human forensics analysis, and pharmaceutical product and food safety, and will be used eventually in human infectious disease diagnosis. In this review, we describe the automated Ibis T5000 instrument and provide examples of how it is used in HAI control.
Keywords: pathogen detection; mass spectrometry; broad-range PCR; ESI-TOF; bacteria; virus; strain typing

Milena Maldini, Francesco Nonnis Marzano, Gloria Gonzalez Fortes, Riccardo Papa, Gilberto Gandolfi, Fish and seafood traceability based on AFLP markers: Elaboration of a species database, Aquaculture, Volume 261, Issue 2, 24 November 2006, Pages 487-494, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.07.010.
(http://www.sciencedirect.com/science/article/B6T4D-4KDBFRF-2/2/72513a0a2b28bfbc88b1437e6112790c)
Abstract:
Several sociological, health and conservation arguments request a correct labelling of seafood products. Nowadays, molecular genetics is a useful tool for food chain traceability, particularly in regards to species identification. Among the variety of PCR-based molecular markers, AFLPs (Amplified Fragment Length Polymorphisms) have recently been used to investigate genomes of different complexities. This paper assesses the potential use of the AFLP technology to determine fish and seafood species in processed commercial products and domestic stocks. In particular a species database of fish, molluscs and crustaceans has been created with the aim to identify species of origin of seafood products by previously defined AFLP patterns. Different EcoRI and TaqI primer combinations were selected from 20 screened combinations in relation to the total number of detected fragments and polymorphic ones. Most informative combinations were E32/T32, E32/T33, E33/T33, E33/T37, E33/T38, E40/T33, E40/T37, E42/T32, E42/T37. The comparison of informative markers between unknown frozen or fresh products and reference samples has enabled the accurate identification of 32 different species. The taxonomic characterization has been performed either at the species or at the population level depending on the number of available individuals. AFLP variation at the population level is particularly helpful for the stock traceability of domestic strains. Size homoplasy was also investigated in one species to assess the rate of non-homologous comigrating fragments and to detect additional polymorphic markers to be used in stock identification. Results of Band Sharing Index (BSI) and percentage of polymorphic fragments are presented and are discussed in relation to the wide applicability of AFLPs both for fish and seafood safety and authenticity testing in such fields as food traceability and restocking management. The database, available upon request at nonnis@biol.unipr.it, will be continuously updated.
Keywords: Molecular biotechnology; Fingerprinting; Food safety; Traceability; Authenticity testing; Homoplasy

Emmanuel K. Yiridoe, Augustine S. Langyintuo, Wilson Dogbe, Economics of the impact of alternative rice cropping systems on subsistence farming: Whole-farm analysis in northern Ghana, Agricultural Systems, Volume 91, Issues 1-2, November 2006, Pages 102-121, ISSN 0308-521X, DOI: 10.1016/j.agsy.2006.02.006.
(http://www.sciencedirect.com/science/article/B6T3W-4JKYWM1-2/2/42187a2f5388dc544020a9a32651c902)
Abstract:

Reducing fallow periods with sown leguminous plants (i.e., Callopogonium mucunoides) was found to be a technically feasible, low-input method of improving soil nutrient levels for rice cropping in the Guinea and Sudan savannah regions of northern Ghana. However, farmers and policy makers are particularly interested in understanding whether the new rice production technology can be substituted for the traditional rice cropping systems within a whole-farm plan context and, if so, what are the likely resource allocation and financial implications to farmers. An optimal whole-farm plan that incorporates traditional (bush fallow) cropping of rice, jointly with livestock production was generated using a linear programming model, and then used to assess the economic implications of introducing the improved fallow (i.e., incorporating Callopogonium mucunoides) rice cropping system. The alternative combinations of enterprises investigated needed to be economically viable household farm units, as well as meet household food security requirements of such resource poor farmers. Introducing the new rice production technology into a base whole-farm model (i.e., under traditional rice cropping) increased rice area by 45%, and farm income above variable costs by 34%. In addition, the representative farm raises six beef cows and 72 poultry birds. In sensitivity analyses of alternative model scenarios, farm incomes were higher and more stable for farming systems using the new rice cropping technology than with the traditional whole-farm model. More widespread adoption of the new rice-based production technology will help transform existing traditional subsistence farming systems to more profitable commercial production systems. This transformation will have implications for farm structure (in terms of consolidation of highly fragmented holdings), agricultural resource management, and property rights (such as recognition of individualized rights to cropland, livestock grazing land and agricultural water resources).
Keywords: Rice; Whole-farm modeling; Subsistence agriculture; Ghana

Timon van den Heuvel, Hans van Trijp, Bart Gremmen, Reint Jan Renes, Cees van Woerkum, Why preferences change: Beliefs become more salient through provided (genomics) information, Appetite, Volume 47, Issue 3, November 2006, Pages 343-351, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.05.009.
(http://www.sciencedirect.com/science/article/B6WB2-4KBVV0B-2/2/e4b873085763deb0e8025e5a049dbfa6)
Abstract:
Information regarding the method of production of food products influences the decision-making process of consumers. The aim of this study is investigate to what extent information about genomics biases consumer decision making. We investigate the exact source of the biasing nature by separating the effect on consumer beliefs and the salience of those beliefs. The effect of information is tested through an information condition concerning two breeding methods, namely classical breeding and breeding enabled by genomics. The results show that consumer preferences are influenced by the information on production technology. More specifically, the consumer preferences change because consumers alter the salience of their beliefs towards the product.
Keywords: Consumer decision making process; Consumer preferences; Consumer beliefs; Belief saliences; Method of production; Genomics

Joseph Evans, Technologies of eating: The development of eating utensils and cuisine in Western Europe and the Americas, 1500-1900, Appetite, Volume 47, Issue 3, November 2006, Page 388, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.08.019.
(http://www.sciencedirect.com/science/article/B6WB2-4M62JN4-K/2/e02f6c193292ca550704a4580ad97190)
Abstract:
This paper examines the development of tools of eating--knives, forks, and spoons--in relation to the development of cooking and cuisine in Europe and the Americas after 1500. The period from the 16th to the 19th centuries witnessed a flood of new foods into the European diet as a result of

the colonization of the Americas and the development of world trade. These new foods radically changed European cuisine leading to the development of highly differentiated, distinct, regional cuisines. The same era was also a time of radical change in the actual mechanics of eating. Prior to the 16th century, it was uncommon for people to have utensils with which to convey food into their mouths, but by the 19th century tools of eating had become fully developed along with a host of manners dictating their use. The evolution of eating utensils and the adoption of their use as a fundamental cultural behavior in turn had profound influence on the evolution of modern cuisines. Drawing on sources from anthropology, the history of technology, and the history of cuisine as well as examples of utensils from The Rietz Collection of Food Technology at the California Academy of Sciences, the development of eating utensils in Western Europe can be traced as a complex interplay of these tools with the changing technologies of cooking and cultural behaviors around eating.

Trevalyn Garner Gruber, 'Fixing' hunger in the 21st century: How food sovereignty might turn agriculture 'Right-side Up', Appetite, Volume 47, Issue 3, November 2006, Page 390, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.08.023.
(http://www.sciencedirect.com/science/article/B6WB2-4M62JN4-R/2/eaaeee63ec25d183604670750550184a)
Abstract:
Continued reliance on science, technology, and industrialization decoupled food from nature which in turn significantly increased global food insecurity. Two main concepts are used by international NGOs to describe linkages between persistent poverty and hunger: the right to food and food security. The 'Right to Food' was conceptualized through the UN's Universal Declaration of Human Rights in 1948 and updated in 1999 as the right to adequate food. Rights-based approaches rely on States to provide quality food and sufficient quantity ensuring that individual rights are met. However, trade agreements, food aid, structural adjustment policies, and internal conflict are all barriers to implementation. During the 1996 World Food Summit, Via Campesina presented a set of conditions that met goals for food rights by reconfiguring world trade. Its 1996 statement noted food sovereignty as a precondition of food security and the right to food as the tool to achieve it. Discussion of food sovereignty is now increasing to larger and more influential groups such as the FAO and Greens/European Free Alliance. The FAO now includes food sovereignty within discussion of hunger, replacing the term security with sovereignty. Beyond definitions lie policy and implementation, which is where organizations differ. As a concept, food sovereignty channels goals of food security, farmers' rights and agrarian reform into an agriculture model without legal boundaries. Two case studies show how food sovereignty works in different parts of the world through work of two NGOs, US-based First Nations Development Institute (FNDI) and UBINIG in Bangladesh. Work by each organization fits into a food sovereignty framework and shows different methods for achieving food security at a local level without government or foreign aid. It is hoped that these two interpretations can be useful for future analysis and discussion.

Robyn Metcalfe, The death of Smithfield Market: Urbanization and the meat markets of 19th-century London, Appetite, Volume 47, Issue 3, November 2006, Page 394, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.08.037.
(http://www.sciencedirect.com/science/article/B6WB2-4M62JN4-17/2/f287f661398bce6f445d064d25a0cc2c)
Abstract:
Although farmers' markets are making a comeback today, they are nothing like the public food markets of the 19th century, particularly if you are looking for fresh meat. The history of fresh meat markets offers insights into society's relationship to meat, their cities, and to the animals that produce their food. Urban markets, such as the Smithfield Live Cattle Market in central London, became the focus of modernization during the 19th century. In 1852, Parliament passed the

Smithfield Market Removal Act to abolish the Smithfield Market, London's historic live cattle market. The removal of the market from the city center was a metaphor for the rupture of modern British society with the old order of pre-industrial Britain. According to George Dodd, who wrote The Food of London in 1856, Smithfield represented a 'continued manifestation of prejudiced adherence to an old system,' a 'continued display of the meat-buying powers of the London Public,' and a 'perennial declaration of the wonderful improvements gradually introduced in the size, quality, and condition of grazing-stock,' a testament to the industrialization and modernization of London. British economic statistics, the arrival of new technology, public discourse, and social reform movements point to a more complicated assessment Smithfield. The interplay between multiple interests includes those of Smithfield's managers, the consumers, butchers, Parliament, and social reformers. Meat would reappear in the city center, but this time as a frozen commodity, separated from live animals and their slaughter. What impact did this have upon the urban food landscape? How did the farmers respond? Perhaps a consideration of the Smithfield Live Cattle Market will shed light on similar market changes in other modern cities during the 19th century.

Sabrina Small, What's eating Andy Warhol? Food and identity in Pop Art, Appetite, Volume 47, Issue 3, November 2006, Page 400, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.08.057.
(http://www.sciencedirect.com/science/article/B6WB2-4M62JN4-1Y/2/637d406c2338ffbd1fd09177afed1ba1)
Abstract:
An examination of Andy Warhol's Pop Art (1960-1978) reveals an artist devoted to all things mass produced, especially food. Easy to obtain and enjoyed by all ranks of society, mass produced American food products, such as Campbell's soup and Hershey bars, carry personal meaning as well as national appeal. The child of Polish immigrants, Warhol consumed and deciphered American food products in an attempt to assimilate. The present study seeks to uncover the specific relationship Andy Warhol had to food products, especially those gracing his paintings and sculptures. Warhol's identification with popular American products and his ability to render these objects as artistically valuable signified his belief that art was universally attainable. As long as pragmatic, democratic and mass produced technologies are in play, art is merely a question of who's doing it rather than who can do it. Warhol's personal addiction to junk-food allows him to identify as American. In a postmodern world, this identity is a byproduct of mass production. Therefore, the repetitive use of food in his art is neither a critique of Warhol, society or consumerism; it is merely a mirror in which the viewer becomes lost. Food is a lens for deconstructing the layers of Warhol as an artist and as a member of consumer culture in the advent of the Pop Art era.

Hiroyuki Wakabayashi, Koji Yamauchi, Mitsunori Takase, Lactoferrin research, technology and applications, 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 1241-1251, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2006.06.013.
(http://www.sciencedirect.com/science/article/B6T7C-4KNMB0V-4/2/adc06595c3ea2e1d33d0100f7a07dfa0)
Abstract:
Lactoferrin is an iron-binding glycoprotein present in milk as well as other exocrine secretions and neutrophil granules in mammals. Lactoferrin is considered to be an important host defense molecule and has a diverse range of physiological functions such as antimicrobial/antiviral activities, immunomodulatory activity, and antioxidant activity. During the past decade, it has become evident that oral administration of lactoferrin exerts several beneficial effects on the health of humans and animals, including anti-infective, anticancer, and anti-inflammatory effects. This has enlarged the application potential of lactoferrin as a food additive. The technology of producing bovine lactoferrin on a factory scale was established over 20 years ago. Bovine lactoferrin is

purified by cation-exchange chromatography from bovine skim milk or whey, and is commercially available from several suppliers. Recombinant human lactoferrin is produced by Aspergillus niger, transgenic cows, and rice, and its efficacy is being evaluated. In this article, we review basic research and technological aspects of the application of lactoferrin.
Keywords: Lactoferrin; Host defense; Antiinfective; Cation-exchange; Food additive

R. Mehra, P. Kelly, Milk oligosaccharides: Structural and technological aspects, 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 1334-1340, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2006.06.008.
(http://www.sciencedirect.com/science/article/B6T7C-4KRY3NB-1/2/636a9551c902c639b36b59dc610874f6)
Abstract:
This review focuses on the more recent scientific information on composition and structural aspects of human and bovine milk oligosaccharides (OS). Advances in high performance liquid chromatography and capillary electrophoresis techniques have been at the forefront in making available efficient analytical methods for OS quantification. More sophisticated tools are available to assist with structural characterisation of milk OS. Furthermore, the review deals with existing and emerging technologies that have a potential for use in large scale fractionation/enrichment of OS, leading to the production of fractions rich in milk OS for use as physiologically active health promoting ingredients in functional dairy foods.
Keywords: Milk oligosaccharides; Structure; Analysis; Production

M.M. O'Kennedy, A. Grootboom, P.R. Shewry, Harnessing sorghum and millet biotechnology for food and health, Journal of Cereal Science, Volume 44, Issue 3, November 2006, Pages 224-235, ISSN 0733-5210, DOI: 10.1016/j.jcs.2006.08.001.
(http://www.sciencedirect.com/science/article/B6WHK-4M3BC6R-1/2/d701597b4890bf1f808715542afd8f65)
Abstract:
This review highlights recombinant DNA technology as a powerful tool to enhance the gene pools of sorghum and pearl millet crops regarded as jewels of Africa. Although important advances in the improvement of these species have been made by classical breeding and modern marker assisted selection, genetic manipulation and in vitro culture allows the gene pool to be broadened beyond that normally available for improvement by allowing the transfer of genes which control well-defined traits between species. The current state of sorghum and millet transformation technology is summarised and applications in the improvement of nutritional quality and the resistance to pathogens and pests for crops grown in Africa and Asia is discussed. Regulatory aspects including gene flow and future prospects are also discussed.
Keywords: Genetic engineering; Sorghum; Pearl millet; Biolistics; Agrobacterium

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

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

Robert Ovetz, The bottom line: An investigation of the economic, cultural and social costs of industrial longline fishing in the Pacific and the benefits of sustainable use marine protected areas,

Marine Policy, Volume 30, Issue 6, November 2006, Pages 809-820, ISSN 0308-597X, DOI: 10.1016/j.marpol.2006.04.001.
(http://www.sciencedirect.com/science/article/B6VCD-4K8Y74R-3/2/c62e3fe8c8a23a2369afa11f4165b5b1)
Abstract:
Industrial longline fishing can be understood as a case study of the cultural, economic, environmental and social impacts of unsustainable fishing technology. While much attention has been attributed to the impact of industrial longlines on the marine ecosystem, little is known about the impact of longline fishing on local food security, employment, cultural belief systems and traditions, revenue generation from marine tourism and climate change. New data demonstrate that the contributions of Marine Protected Areas, marine tourism and recreational fishing to local coastal economies dwarf the contributions of longline fishing. When combined with the impact of overfishing on coastal fishing communities and fish consumers, policies promoting sustainable fisheries must be expanded to take these other factors into account along with issues of biodiversity.
Keywords: Longline fishing; Sea turtles; Recreational fishing; Marine tourism

E.J. Greenacre, T.F. Brocklehurst, The Acetic Acid Tolerance Response induces cross-protection to salt stress in Salmonella typhimurium, International Journal of Food Microbiology, Volume 112, Issue 1, 15 October 2006, Pages 62-65, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.05.012.
(http://www.sciencedirect.com/science/article/B6T7K-4KD5BMF-2/2/a9ddd00dde5b08a3e015153aa483eadd)
Abstract:
Salmonella typhimurium induces an Acid Tolerance Response (ATR) upon exposure to mildly acidic conditions in order to protect itself against severe acid shock. This response can also induce cross-protection to other stresses such as heat and salt. We investigated whether both the acetic acid induced and lactic acid induced ATR in S. typhimurium provided cross-protection to a salt stress at 20 [degree sign]C. Acid-adapted cells were challenged with both a sodium chloride (NaCl) and potassium chloride (KCl) shock and their ability to survive ascertained. Acetic acid adaptation provided cells with protection against both NaCl and KCl stress. However, lactic acid adaptation did not protect against either osmotic stressor and rendered cells hypersensitive to NaCl. These results have implications for the food industry where hurdle technology means multiple sub-lethal stresses such as mild pH and low salt are commonly used in the preservation of products.
Keywords: Salmonella typhimurium; Cross-protection; Acid Tolerance Response; Acetic acid; Lactic acid

Tahirou Abdoulaye, John H. Sanders, New technologies, marketing strategies and public policy for traditional food crops: Millet in Niger, Agricultural Systems, Volume 90, Issues 1-3, October 2006, Pages 272-292, ISSN 0308-521X, DOI: 10.1016/j.agsy.2005.12.008.
(http://www.sciencedirect.com/science/article/B6T3W-4JCCM67-1/2/f080733577dabc9deab95ca852f222cd)
Abstract:
New technology introduction in this semiarid region of the Sahel is hypothesized to be made more difficult by three price problems in the region. First, staple prices collapse annually at harvest. Secondly, there is a between year price collapse in good and very good years due to the inelastic demand for the principal staple, millet, and the large changes in supply from weather and other stochastic factors. Thirdly, government and NGOs intervene in adverse rainfall years to drive down the price increases. Marketing strategies were proposed for the first two price problems and a public policy change for the third. To analyze this question at the firm level a farm programming model was constructed. Based upon surveying in four countries, including Niger, farmers state that

they have two primary objectives in agricultural production, first achieving a harvest income target and secondly achieving their family subsistence objective with production and purchases later in the year. Farmers are observed selling their millet at harvest and rebuying millet later in the year. So the first objective takes precedence over the second. A lexicographic utility function was used in which these primary objectives of the farmer are first satisfied and then profits are maximized. According to the model new technology would be introduced even without the marketing strategies. However, the marketing strategies accelerated the technology introduction process and further increased farmers' incomes. Of the three marketing-policy changes only a change in public policy with a reduction of the price depressing effect (cereal imports or stock releases) substantially increases farmers' incomes in the adverse years. In developed countries crop insurance and disaster assistance is used to protect farmers in semiarid regions during bad and very bad (disaster) rainfall years. In developing countries finding alternatives to the poverty-nutritional problems of urban residents and poor farmers to substitute for driving down food prices in adverse years could perform the same function as crop insurance in developed countries of facilitating technological introduction by increasing incomes in adverse rainfall years in developed countries.
Keywords: Inventory credit; Marketing strategy; Inorganic fertilizers; Fertility depletion; Farm level programming; Micro-fertilization; Sidedressing

S. Mulsow, Y. Krieger, R. Kennedy, Sediment profile imaging (SPI) and micro-electrode technologies in impact assessment studies: Example from two fjords in Southern Chile used for fish farming, Journal of Marine Systems, Volume 62, Issues 3-4, Sediment Profile Imagery Colloquium of Experts (SPICE), October 2006, Pages 152-163, ISSN 0924-7963, DOI: 10.1016/j.jmarsys.2005.09.012.
(http://www.sciencedirect.com/science/article/B6VF5-4K6CPNG-1/2/3a58ff1b14ef417837e8462982b80308)
Abstract:
Two state-of-the-art techniques were used to assess the impact of organic loading from fish farming in two fjords of Southern Chile, Pillan and Renihue Fjords. A sediment profile imaging (SPI) camera was deployed and sediment microprofiles (oxygen, H2S, redox and pH) were measured in undisturbed sediment cores collected using a HAPS corer. Four out of seven stations in Pillan Fjord were found to be severely disturbed: SPI images showed azoic conditions (no apparent Redox Potential Discontinuity layer, no evidence of aerobic life form, presence of an uneaten fish food layer, negative OSI scores). These findings were corroborated by very high oxygen consumption rates (700-1200 mmol m- 2 day- 1), H2S concentrations increasing quickly within the sediment column and redox potential decreasing towards negative values within a few mm down core. Results for Renihue Fjord were not so straightforward. SPI images indicated that most of the stations (R3 to R7) presented well-mixed conditions (high apparent RPD layers, presence of infauna, burrows, etc.), but oxygen profiles yielded consumption rates of 230 to 490 mmol m- 2 day- 1 and organic carbon mineralization of 2.16 to 4.53 g C m- 2 day- 1. These latter values were close to the limit of aerobic degradation of organic matter although no visible changes were recorded within the sediment column. In view of our findings, the importance of integrating multidisciplinary methodologies in impact assessment studies was discussed.
Keywords: Microprofile; Benthos; Eutrophication; Fish farming; SPI

M. Zhang, J. Tang, A.S. Mujumdar, S. Wang, Trends in microwave-related drying of fruits and vegetables, Trends in Food Science & Technology, Volume 17, Issue 10, October 2006, Pages 524-534, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.04.011.
(http://www.sciencedirect.com/science/article/B6VHY-4K0C9HW-2/2/a99df348cc7632608df39c676d1c15de)
Abstract:

Microwave (MW)-related (MW-assisted or MW-enhanced) combination drying is a rapid dehydration technique that can be applied to specific foods, particularly to fruits and vegetables. Increasing concerns over product quality and production costs have motivated the researchers to investigate and the industry to adopt combination drying technologies. The advantages of MW-related combination drying include the following: shorter drying time, improved product quality, and flexibility in producing a wide variety of dried products. But current applications are limited to small categories of fruits and vegetables due to high start-up costs and relatively complicated technology as compared to conventional convection drying. MW-related combination drying takes advantages of conventional drying methods and microwave heating, leading to better processes than MW drying alone. This paper presents a comprehensive review of recent progresses in MW-related combined drying research and recommendations for future research to bridge the gap between laboratory research and industrial applications.

Amparo Lopez-Rubio, Rafael Gavara, Jose M. Lagaron, Bioactive packaging: turning foods into healthier foods through biomaterials, Trends in Food Science & Technology, Volume 17, Issue 10, October 2006, Pages 567-575, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.04.012.
(http://www.sciencedirect.com/science/article/B6VHY-4K0C9HW-3/2/2094de51a6e01d284f72df5606979797)
Abstract:
This paper sets the bases for the creation of innovative technological developments in the production of functional foods, whose bioactive principles and actuators are devised to be contained within packaging or coating materials. Therefore, it gives rise to a novel conceptual approach to develop functional foods, while setting the roots of a new packaging technology termed as bioactive packaging, in which, a food package or coating is given the unique role of enhancing food impact over the consumer's health. The paper is purposely designed to gather some of the most potential or promising developments, which are either bioactive material concepts or which can be advantageously applied to become such. Moreover, the industrial benefits of enclosing bioactives within packaging or coating materials over their direct inclusion in foods are outlined. The technologies reviewed include novel integration technologies, micro- and nanoencapsulation and enzyme encapsulation and/or immobilization. All of these technologies are found to have excellent allies in the particular properties exhibited by biopolymers.

Jianbo Lu, Xia Li, Review of rice-fish-farming systems in China -- One of the Globally Important Ingenious Agricultural Heritage Systems (GIAHS), Aquaculture, Volume 260, Issues 1-4, 29 September 2006, Pages 106-113, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.05.059.
(http://www.sciencedirect.com/science/article/B6T4D-4K6644S-1/2/8dc191cba8c61b4cb71fac8f1cdd3dda)
Abstract:
Rice-fish-farming systems constitute a unique agro-landscape across the world, especially in tropical and sub-tropical Asia. Rice is a globally important staple food crop, with a wide distribution and constituting diversified varieties. The introduction of fish rearing to rice farming creates an integrated agro-ecological system. China boasts a history of 1700 years in rice-fish-farming practice. It is no longer a sole agro-production practice, but an agro-cultural pattern. Therefore, it has been listed by the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) as one of the Globally Important Ingenious Agricultural Heritage Systems (GIAHS). Qingtian County of the Zhejiang province has been selected as a pilot conservation site. The rice-fish-farming systems in China diversify China's agro-landscape and favor the conservation of species variety of both rice and fish. The survival of deep-water rice, an indigenous rice variety, and Oujiang red carp, an indigenous fish variety, are cases in point. Being low external input systems, the rice-fish-farming systems necessitate only small amounts of pesticide and fertilizer. The application of pesticides

can be lowered to 50% of that of modern, high-input rice production; sometimes, no pesticide application is required. The natural enemies of rice pests show a prominent rise, making the bio-control of rice diseases and pests highly feasible. The rice-fish-farming system is also of great significance in global food security and global change. It provides food and animal protein for subsistence farmers living in ecologically-fragile mountainous regions. It also reduces economic risks that these farmers potentially face. The nitrogen-fixation role of the system increased the content of organic matter, total nitrogen and total phosphorus in the soil by 15.6-38.5%. It also reduces the emission of CH4 by nearly 30% compared with traditional rice farming. However, the economical development and industrialization in China pose a threat to rice-fish farming and, consequently, the numbers of farmers involved in rice-fish farming are decreasing. This calls for the Chinese government to engage itself in the conservation and development of this system and to innovate the existing technologies. It would also be useful, in the meantime, to exploit and conserve rice-fish farming as eco-tourism resources, so that the income of the mountainous farmers can be increased and this important, indigenous agro-culture be conserved and developed.
Keywords: Agro-landscape; Agro-biological diversity; Low external input; Integrated eco-system; Global change; Protective strategies

Medana Zamfir, Marc Vancanneyt, Lefteris Makras, Frederik Vaningelgem, Karen Lefebvre, Bruno Pot, Jean Swings, Luc De Vuyst, Biodiversity of lactic acid bacteria in Romanian dairy products, Systematic and Applied Microbiology, Volume 29, Issue 6, 11 September 2006, Pages 487-495, ISSN 0723-2020, DOI: 10.1016/j.syapm.2005.10.002.
(http://www.sciencedirect.com/science/article/B7GVX-4HK03DV-1/2/199d47080c13e64831fae4f91c204237)
Abstract:
Traditionally fermented dairy products are still a very important part of the daily food in Romania, especially for people living in the countryside. To study the biodiversity of lactic acid bacterium strains of these products, 110 samples (raw and fermented milk, sour cream, and cheese) were collected from farm houses, monasteries, and local markets throughout Romania. Lactic acid bacteria (LAB) were isolated using six different cultivation conditions. All 599 isolates were tested for their Gram reaction, catalase activity, and morphology. A rep-PCR fingerprinting technique with the (GTG)5 primer and, in some cases SDS-PAGE of total cell proteins and 16S rRNA gene sequencing were used to cluster and/or identify the LAB. The biodiversity of the isolated strains was correlated with the type of product and/or technology applied. The most frequent LAB found in Romanian raw milk and fermented dairy products were Lactococcus lactis, Leuconostoc spp., and Enterococcus spp. Among the latter, a new species E. saccharominimus was found.
Keywords: Raw milk; Fermented dairy products; Biodiversity; Lactic acid bacteria; Polyphasic identification

Martha Zarain-Herzberg, Angel I. Campa-Cordova, Ronaldo O. Cavalli, Biological viability of producing white shrimp Litopenaeus vannamei in seawater floating cages, Aquaculture, Volume 259, Issues 1-4, 8 September 2006, Pages 283-289, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.05.044.
(http://www.sciencedirect.com/science/article/B6T4D-4K3KC2N-3/2/458c7d220286f35d35a210f97b0b2580)
Abstract:
In the last few years, in an attempt to foment the controlled culture of penaeid shrimp by artisanal fishermen communities, an innovative culture technology using floating cages have been developed in Brazil. In this work, we assessed the biological viability of culturing the Pacific white shrimp Litopenaeus vannamei in floating cages at different stocking densities in Santa Maria's Bay, Mexico. Additionally, the influence of artificial substrates on growth performance of the shrimp

was analyzed. Cages made of PVC-coated polyester mesh supported by wooden poles and PVC tubes were used for this study. Post larvae (PL) were stocked in four nursery cages at 700 PL per m2. After 30 days of nursery culture, shrimp had reached an average weight of 0.5 g and were then transferred to grow out cages at densities of 100, 150, and 200 shrimp per m2, with and without the addition of artificial substrates. Survival rate was neither affected by stocking density nor by the presence of added artificial substrates. In contrast, final shrimp weight was higher for those reared at low densities (100 shrimp per m2) and the use of artificial substrates showed a positive effect on final shrimp weight. After 2 months of culture survival rate was above 90%, the shrimp weight ranged from 6.94 +/- 1.51 g to 9.33 +/- 1.48 g and yields varying from 818 to 1297 g/m2 were recorded.
The high shrimp production in floating cages was probably due to optimum environmental and rearing conditions provided to the shrimp. The present results confirmed the deleterious effect of high stocking density on shrimp growth, demonstrated the benefits of adding artificial food substrates to the cages, and proved the biological viability of culturing L. vannamei in seawater floating cages in Mexico.
Keywords: Penaeid; Shrimp; Floating cages; Mariculture; Litopenaeus vannamei

L. Irvine, A. Kleczkowski, A.M.J. Lane, J.W. Pitchford, D. Caffrey, P.M. Chamberlain, An integrated data resource for modelling the soil ecosystem, Applied Soil Ecology, Volume 33, Issue 2, Soil Biodiversity in an Upland Grassland, September 2006, Pages 208-219, ISSN 0929-1393, DOI: 10.1016/j.apsoil.2005.11.005.
(http://www.sciencedirect.com/science/article/B6T4B-4JWFGVH-2/2/89fa76af1e19f6afac2c0fa26990efba)
Abstract:
This paper describes the NERC Soil Biodiversity Programme's integrated approach to data, information management and analysis, from field sampling through to modelling the soil ecosystem. It discusses the handling of meta-data from sampling in the field, construction of an integrated database to provide the framework whereby project data and meta-data can be linked and analysed together, and the development of the web-based data discovery and delivery system that fronts the database. The paper then describes how such data can be synthesised into mathematical models, concentrating initially on the Stable Isotope Modelling (SIM) framework before moving on to discuss models incorporating temporal and spatial dynamics. The paper concludes with a discussion of the future challenges facing soil modelling, and the potential of the technologies developed by the programme in helping to meet these challenges.
Keywords: Database; Information system; Soil Ecosystem Model; Food web

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

Hannu Korhonen, Anne Pihlanto, Bioactive peptides: Production and functionality, International Dairy Journal, Volume 16, Issue 9, 4th NIZO Dairy Conference - Prospects for Health, Well-being and Safety, September 2006, Pages 945-960, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2005.10.012.
(http://www.sciencedirect.com/science/article/B6T7C-4J90VYF-1/2/09b46e832a2988cb4680cb3208751a3c)
Abstract:
Milk proteins exert a wide range of nutritional, functional and biological activities. Many milk proteins possess specific biological properties that make these components potential ingredients of health-promoting foods. Increasing attention is being focused on physiologically active peptides derived from milk proteins. These peptides are inactive within the sequence of the parent protein molecule and can be liberated by (1) gastrointestinal digestion of milk, (2) fermentation of milk with proteolytic starter cultures or (3) hydrolysis by proteolytic enzymes. Milk protein derived peptides have been shown in vivo to exert various activities affecting, e.g., the digestive, cardiovascular, immune and nervous systems. Studies have identified a great number of peptide sequences with specific bioactivities in the major milk proteins and also the conditions for their release have been determined. Industrial-scale technologies suitable for the commercial production of bioactive milk peptides have been developed and launched recently. These technologies are based on novel membrane separation and ion exchange chromatographic methods being employed by the emerging dairy ingredient industry. A variety of naturally formed bioactive peptides have been found in fermented dairy products, such as yoghurt, sour milk and cheese. The health benefits attributed to peptides in these traditional products have, so far, not been established, however. On the other hand, there are already a few commercial dairy products supplemented with milk protein-derived bioactive peptides whose health benefits have been documented in clinical human studies. It is envisaged that this trend will expand as more knowledge is gained about the multifunctional properties and physiological functions of milk peptides.

Keywords: Milk proteins; Bioactive peptides; Hydrolysis; Fermentation; Enrichment; Functionality; Health effects

J.P. Kerry, M.N. O'Grady, S.A. Hogan, Past, current and potential utilisation of active and intelligent packaging systems for meat and muscle-based products: A review, 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 113-130, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2006.04.024.
(http://www.sciencedirect.com/science/article/B6T9G-4JXXR7K-2/2/7990b54e6a9354139a2f4935fa9eb3e8)
Abstract:
Interest in the use of active and intelligent packaging systems for meat and meat products has increased in recent years. Active packaging refers to the incorporation of additives into packaging systems with the aim of maintaining or extending meat product quality and shelf-life. Active packaging systems discussed include oxygen scavengers, carbon dioxide scavengers and emitters, moisture control agents and anti-microbial packaging technologies. Intelligent packaging systems are those that monitor the condition of packaged foods to give information regarding the quality of the packaged food during transport and storage. The potential of sensor technologies, indicators (including integrity, freshness and time-temperature (TTI) indicators) and radio frequency identification (RFID) are evaluated for potential use in meat and meat products. Recognition of the benefits of active and intelligent packaging technologies by the food industry, development of economically viable packaging systems and increased consumer acceptance is necessary for commercial realisation of these packaging technologies.
Keywords: Meat; Packaging; Active; Intelligent

Catherine Nettles Cutter, Opportunities for bio-based packaging technologies to improve the quality and safety of fresh and further processed muscle foods, 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 131-142, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2006.04.023.
(http://www.sciencedirect.com/science/article/B6T9G-4JXXR7K-3/2/3a74cb2bcb0cb8398b49aabc83d260c8)
Abstract:
It has been well documented that vacuum or modified atmosphere packaging materials, made from polyethylene- or other plastic-based materials, have been found to improve the stability and safety of raw or further processed muscle foods. However, recent research developments have demonstrated the feasibility, utilization, and commercial application of a variety of bio-based polymers or bio-polymers made from a variety of materials, including renewable/sustainable agricultural commodities, and applied to muscle foods. A variety of these bio-based materials have been shown to prevent moisture loss, drip, reduce lipid oxidation and improve flavor attributes, as well as enhancing the handling properties, color retention, and microbial stability of foods. With consumers demanding more environmentally friendly packaging and a desire for more natural products, bio-based films or bio-polymers will continue to play an important role in the food industry by improving the quality of many products, including fresh or further processed muscle foods.
Keywords: Packaging; Edible; Bio-based polymers; Biopolymers; Muscle foods

J.N. Belcher, Industrial packaging developments for the global meat market, 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 143-148, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2006.04.031.

(http://www.sciencedirect.com/science/article/B6T9G-4JYTJ91-1/2/e9dbb1313fe5a87efabf98f74af06b32)
Abstract:
Packaging companies must carefully monitor retail and consumer trends to best utilize, direct, or prioritize their research dollars in developing packaging and packaging systems to meet these demands. This paper reviews packaging developments that are resulting from numerous trends taking place in the meat industry and in the retail sector. Current case ready packaging solutions that meet the needs of retailers to reduce labor in the back of the retail stores, and the consumer needs for a fresh product with excellent quality and palatability are also discussed. It will also review the current packaging options that are being developed to help consumers battle their 'time crunch' with ready meal solutions. Finally, the necessity to increase food safety or eliminate pathogens while producing a high quality product continues to drive packaging development. Current systems and packaging available for post packaging pasteurization will be discussed.
Keywords: Meat packaging; Case ready fresh red meat; Ready meals; Post packaging pasteurization; Consumers; Technology

A. Milstein, A.F. Ahmed, O.A. Masud, A. Kadir, M.A. Wahab, Effects of the filter feeder silver carp and the bottom feeders mrigal and common carp on small indigenous fish species (SIS) and pond ecology, Aquaculture, Volume 258, Issues 1-4, 31 August 2006, Pages 439-451, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.04.045.
(http://www.sciencedirect.com/science/article/B6T4D-4K66DR7-1/2/96f946194f64e6375c1beccbcb460224)
Abstract:
A sustainable semi-intensive pond aquaculture technology including major carp species as cash-crop and small indigenous fish species (SIS) as food for the farmers' families is being optimized in Bangladesh. The inclusion of silver carp (Hypophthalmichthys molitrix), a cheap large species affordable by poor farmers, is now being considered. As part of a study on the effects of this filter feeder on polycultures including the SIS punti (Puntius sophore) and mola (Amblypharyngodon mola), an experiment was carried out in the ponds of the Bangladesh Agricultural University, Mymensingh, to test this fish effects in the presence of the bottom feeders either common carp (Cyprinus carpio) or mrigal (Cirrhinus cirrhosus) on production/reproduction of SIS, on the other fish species and on pond ecology. The data were analyzed using univariate and multivariate statistical techniques.
Reproduction of both SIS species occurred in all ponds, their fry numbers, weight and biomass at harvest not being affected either by silver carp or by the bottom feeder species. The addition of silver carp in mrigal ponds had a negative effect on both adult SIS, while its addition to carp ponds had a weaker negative effect on mola and a positive effect on punti. Common carp favoured mola growth and reduced punti survival. Silver carp performance was not affected by the species of bottom feeder present. Common carp performance was not affected by silver carp. Mrigal harvesting biomass and survival were not affected by silver carp, but its harvesting weight, growth rate and yield decreased respectively by 29%, 42% and 39% in its presence. Large carp and total harvested biomass and yields were over 50% higher when silver carp was also present. In the presence of silver carp, large carp and total yields were 20% higher in common carp ponds, while in its absence they were somewhat higher in mrigal ponds. The FCR calculated considering only the large fish were 10% higher in mrigal ponds. FCR calculated including all species were somewhat higher in common carp ponds without silver carp, and 35% higher in mrigal ponds with silver carp. The observed results are explained and discussed considering the feeding habits of each species, the natural food web, and the ecological processes developing in the ponds.
The addition of silver carp did not reduce the income obtained from the cash-crop species and could contribute to the nutrition and/or extra income of the farmer's family. From the production

and ecological point of views, addition of silver carp to common carp ponds is a better proposition than to add it to mrigal ponds.
Keywords: Common carp; Food web; Mola; Mrigal; Polyculture; Punti; Silver carp; SIS small indigenous species

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

G.J. Partridge, G.A. Sarre, B.M. Ginbey, G.D. Kay, G.I. Jenkins, Finfish production in a static, inland saline water body using a Semi-Intensive Floating Tank System (SIFTS), Aquacultural Engineering, Volume 35, Issue 2, August 2006, Pages 109-121, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2005.09.001.
(http://www.sciencedirect.com/science/article/B6T4C-4HC772M-5/2/b809368bc514a5fa0c3effbd05c4eab4)
Abstract:
Using a newly developed culture technology known as the Semi-Intensive Floating Tank System (SIFTS), rainbow trout (Oncorhynchus mykiss), mulloway (Argyrosomus japonicus) and barramundi (Lates calcarifer) were produced in a 0.13 ha static, inland saline water body over a period of 292 days, yielding the equivalent of 26 tonnes/(ha year). Rainbow trout were grown with an FCR of 0.97 from 83 to 697 g over 111 days (specific growth rate (SGR), 1.91%/day) between June and September, when average daily water temperatures ranged from 12.3 to 18.2 [degree sign]C. Over the same time period, mulloway grew only from 100 to 116 g, however, once temperatures increased to approximately 21 [degree sign]C in October, food intake increased and

mulloway grew to an average size of 384 g over 174 days with an SGR and FCR of 0.68%/day and 1.39, respectively. Barramundi stocked in November with an average weight of 40 g increased to 435 g in 138 days (SGR 1.73%/day) with an FCR of 0.90. The SIFTS significantly reduced nutrient input into the pond by removing settleable wastes as a thick sludge with a dry matter content of 5-10%. The total quantity of dry waste removed over the culture period was 527 kg (5 tonnes/(ha year)), which was calculated to contain 15 kg of nitrogen (144 kg/(ha year)) and 16 kg of phosphorus (153 kg/(ha year)). The release of soluble nutrients into the pond resulted in blooms of macro- and micro-algae which caused large and potentially lethal diurnal fluctuations in dissolved oxygen within the pond, however, comparatively stable levels of dissolved oxygen were maintained within each SIFT1 through the use of air lift pumps.
Keywords: Saline groundwater; Barramundi; Rainbow trout; Mulloway; Pond yield; SIFTS; Waste removal

Visith Chavasit, Supaporn Kunhawattana, Wachira Jirarattanarangsri, Production and contamination of pasteurized beverages packed in sealed plastic containers in Thailand and potential preventive measures, Food Control, Volume 17, Issue 8, August 2006, Pages 622-630, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2005.04.011.
(http://www.sciencedirect.com/science/article/B6T6S-4GKWHWF-1/2/45d4b20404188ac61d8a2811fd3114b5)
Abstract:
From 35 premises that were sampled in this study, 86%, 69%, 59%, and 13% of pasteurized beverages packed in sealed plastic containers were contaminated with yeast, mold, coliform, or E. coli, respectively. The products could be divided into two groups, i.e., heat sensitive and non-heat sensitive. At least 45% of the premises did not pass the Thai Food and Drug Administration (FDA) requirements for GMP. Chlorine treatment and temperature control were needed for heat sensitive products. Appropriate equipment and methods for double boiling, cooling, washing containers, and sanitizing utensils were developed. The developed systems were found to be feasible in four tested premises.
Keywords: Pasteurized beverages; Microbial contamination; Appropriate technology

D.B. Pinto, I. Castro, A.A. Vicente, The use of TIC's as a managing tool for traceability in the food industry, Food Research International, Volume 39, Issue 7, August 2006, Pages 772-781, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.01.015.
(http://www.sciencedirect.com/science/article/B6T6V-4JRKCVN-1/2/8c65f9da775cb052def66c99185f4b8a)
Abstract:
Food safety has become an important food quality attribute. Both food industry and authorities need to be able to trace back and to authenticate food products and raw materials used for food production to comply with legislation and to meet the food safety and food quality requirements.
PaniGest is a user-friendly computer package designed to manage traceability and help in the quality control and production improvement. This application was developed in Visual Basic language over an SQL database and its main features are: to register quality control parameters of raw materials, in-course products and final products; to manage reception, production and expedition orders; to analyse production costs, productivity, raw materials and products' consumptions; to trace products during the food chain. It runs on a personal computer over Windows 95/98 or Windows 2000/XP operating system. The program also uses common Internet Browsers to make information available to users.
Keywords: Food safety; Traceability; Visual basic; Technology of information and communication (TIC)

Linda Lemar, David Haytowitz, Marybeth Bingham, Rena Cutrufelli, Robin Thomas, The Nutrient Data Laboratory Web site gets a new look, Journal of Food Composition and Analysis, Volume 19, Supplement 1, 28th US National Nutrient Databank Conference, August 2006, Pages S96-S99, ISSN 0889-1575, DOI: 10.1016/j.jfca.2006.01.008.
(http://www.sciencedirect.com/science/article/B6WJH-4JRVDVS-7/2/c06ed8f92c5cdf9d0e9c7cc018fe8071)
Abstract:
The Nutrient Data Laboratory Web site, along with all Agricultural Research Service (ARS) Web sites, has a new look. The basic appearance is similar to the United States Department of Agriculture Web site, but with some navigational categories unique to ARS sites. The purpose of these changes is to make ARS Web sites more uniform in navigation, enhancing overall ease of use. Navigation tools now found on our Web site include links to: About Us, Research, Products & Services, People and Places, News and Events, Partnering, and Careers. Partnering, a section recently added to the Web site, includes information detailing our numerous research collaborations with scientists in educational institutions, research laboratories, the food industry and other federal agencies as well as our award-winning partnerships for technology transfer. The online search program, our most frequently accessed feature, remains prominently displayed on our Home Page, continuing to give users fast access to nutrient information on a specific food. This popular program has been upgraded, supporting enhanced search techniques and the capability to customize portion sizes for food component reports. The NDL Web site is the principal means of dissemination of food composition data from the National Nutrient Databank System and receives an average of over 110,000 visitors per month.
Keywords: Nutrient Data Laboratory Web site

J. Bertrandt, M. Dlugaszek, A. Klos, M. Szopa, Iron Supply with Daily Food Rations Used for Alimentation the Polish Military University of Technology Female Students, Journal of the American Dietetic Association, Volume 106, Issue 8, Supplement 1, ADA FNCE Food & Nutrition Conference & Expo 2006, August 2006, Page A44, ISSN 0002-8223, DOI: 10.1016/j.jada.2006.05.280.
(http://www.sciencedirect.com/science/article/B758G-4KG2GYR-45/2/8b35d16b0e458980b6f99cd53c7d2369)

Glyn O. Phillips, R.J. Whitehurst, Editor, Emulsifiers in Food Technology, Blackwell Publishing (2004) ISBN 1405118024, p. 264 Price [pound sign]99.50. Available on-line at www.blackwellpublishing.com., Food Hydrocolloids, Volume 20, Issue 5, July 2006, Page 757, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2005.02.002.
(http://www.sciencedirect.com/science/article/B6VP9-4J84SYJ-1/2/c57689ed44770e157a8713b375fe3baa)

A. Huotilainen, A.-M. Pirttila-backman, H. Tuorila, How innovativeness relates to social representation of new foods and to the willingness to try and use such foods, Food Quality and Preference, Volume 17, Issue 5, July 2006, Pages 353-361, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2005.04.005.
(http://www.sciencedirect.com/science/article/B6T6T-4GCX081-2/2/f5c2b26dd1ec8e5debb6ed838ace81da)
Abstract:
The relationship between domain specific innovativeness scale (DSI) and social representation (SR) components of new foods (suspicion of new foods; adherence to natural food; adherence to technology; eating as an enjoyment; eating as a necessity) was explored in a survey with Finnish consumers (N = 1156). Both DSI and SR were used to predict willingness to try/use new foods, categorized into six subgroups of which three were functional (cereal-based and otherwise

functional foods; functional drinks), and the remaining three categories were modified dairy products, organic products, and energy drinks. Enjoyment and low suspicion predicted 27% of variation in DSI, which, in turn, predicted up to 6% of willingness to try categories of new foods, excluding organic products. When added to the predictive model, SR components increased the prediction of all food categories, particularly functional cereal-based and organic products (up to 20.4%). Thus, DSI predicted willingness to try new foods to some extent, but SR components, most of all low suspicion of new foods and adherence to natural food, significantly improved the prediction.
Keywords: New foods; Innovators; Social representations

Ellen van Kleef, Hans C.M. van Trijp, Pieternel Luning, Internal versus external preference analysis: An exploratory study on end-user evaluation, Food Quality and Preference, Volume 17, Issue 5, July 2006, Pages 387-399, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2005.05.001.
(http://www.sciencedirect.com/science/article/B6T6T-4GGWGB0-1/2/06961702d0684ee9fc31cfcf69711bd6)
Abstract:
Internal and external preference analysis emphasise fundamentally different perspectives on the same data. We extend the literature on comparisons between internal and external preference analysis by incorporating the perspective of the end user of the preference analysis results. From a conceptual analysis of the methodological similarities and differences between these two techniques, we develop and implement a framework for end-user evaluation of preference analysis output in terms of perceived actionability for food technology, marketing and creative purposes as well as comprehensibility and perceived appropriateness at the marketing-R&D interface. Overall, this exploratory study suggests that end-users find information from external analysis more actionable for food technological tasks. Internal preference analysis holds a clear advantage on marketing actionability and new product creativity. No preference technique holds a clear advantage on marketing-R&D interface appropriateness and comprehensibility. Rather than recommending applying both techniques, we suggest several ways forward in better exploiting the synergy between these two approaches.
Keywords: Internal versus external preference analysis; Consumer understanding; Product development; End-user evaluation

Parita Thanasukarn, Rungnaphar Pongsawatmanit, David Julian McClements, Utilization of layer-by-layer interfacial deposition technique to improve freeze-thaw stability of oil-in-water emulsions, Food Research International, Volume 39, Issue 6, July 2006, Pages 721-729, ISSN 0963-9969, DOI: 10.1016/j.foodres.2006.01.010.
(http://www.sciencedirect.com/science/article/B6T6V-4JDVNVY-1/2/790ade629fb68ec5b47260f2ce93f671)
Abstract:
The freeze-thaw stability of 5 wt% hydrogenated palm oil-in-water emulsions (pH 3) containing droplets stabilized by sodium dodecyl sulfate (SDS)-chitosan-pectin membranes was studied. The multilayered interfacial membranes were created using an electrostatic layer-by-layer deposition method. The [zeta]-potential, mean particle diameter, fat destabilization, apparent viscosity and microstructure of the emulsions were used to examine the influence of freezing on their stability. Emulsions containing oil droplets stabilized only by SDS were highly unstable to droplet coalescence when either the oil phase became partially crystallized or the water phase crystallized. Emulsions containing oil droplets stabilized by SDS-chitosan membranes were stable to droplet coalescence, but unstable to droplet flocculation. Emulsions containing droplets stabilized by SDS-chitosan-pectin membranes were stable to both droplet coalescence and flocculation. The interfacial engineering technology utilized in this study could lead to the creation of food emulsions with improved stability to freeze-thaw cycling.

Keywords: Layer-by-layer deposition; Multiple layered membranes; Emulsions; Freeze-thaw cycling

B.G. Hammond, R. Dudek, J.K. Lemen, M.A. Nemeth, Results of a 90-day safety assurance study with rats fed grain from corn borer-protected corn, Food and Chemical Toxicology, Volume 44, Issue 7, July 2006, Pages 1092-1099, ISSN 0278-6915, DOI: 10.1016/j.fct.2006.01.003.
(http://www.sciencedirect.com/science/article/B6T6P-4J91NKN-5/2/90c95f586b02b8108622e89881e3e9e2)
Abstract:
The results of a 90-day rat feeding study with grain from MON 810 corn (YieldGard(R) Cornborer - YieldGard Cornborer is a registered trademark of Monsanto Technology, LLC) that is protected against feeding damage from corn and stalk boring lepidopteran insects are presented. Corn borer protection was accomplished through the introduction of cry1Ab coding sequences into the corn genome for in planta production of a bioactive form of Cry1Ab protein. Grain from MON 810 and its near-isogenic control was separately formulated into rodent diets at levels of 11% and 33% (w/w) by Purina Mills, Inc. (PMI). All diets were nutritionally balanced and conformed to PMI specifications for Certified LabDiet(R) (PMI Certified LabDiet 5002 is a registered trademark of Purina Mills, Inc.) 5002. There were a total of 400 rats in the study divided into 10 groups of 20 rats/sex/group. The responses of rats fed diets containing MON 810 were compared to those of rats fed grain from conventional corn varieties. Overall health, body weight, food consumption, clinical pathology parameters (hematology, blood chemistry, urinalysis), organ weights, and gross and microscopic appearance of tissues were comparable between groups fed diets containing MON 810 and conventional corn varieties. This study complements extensive agronomic, compositional and farm animal feeding studies with MON 810 grain, confirming that it is as safe and nutritious as grain from existing commercial corn varieties.
Keywords: Corn: genetically modified; Corn borer protected; MON 810; Rat feeding study

H. Douglas Goff, R.J. Whitehurst, Editor, Emulsifiers in Food Technology, Blackwell Publishing, Oxford, UK (2004) ISBN 1-4051-1802-4 (247pp., 15 cmx23 cm format, [pound sign]99.50, available at www.blackwellpublishing.com)., International Dairy Journal, Volume 16, Issue 7, July 2006, Page 829, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2005.11.005.
(http://www.sciencedirect.com/science/article/B6T7C-4J8CX7K-1/2/7c0c882fe45fa40078395ef401169f96)

Philip Doganis, Alex Alexandridis, Panagiotis Patrinos, Haralambos Sarimveis, Time series sales forecasting for short shelf-life food products based on artificial neural networks and evolutionary computing, Journal of Food Engineering, Volume 75, Issue 2, July 2006, Pages 196-204, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.03.056.
(http://www.sciencedirect.com/science/article/B6T8J-4GFNFSR-1/2/b155b6a30db327eecbc18e75120e2386)
Abstract:
Due to the strong competition that exists today, most manufacturing organizations are in a continuous effort for increasing their profits and reducing their costs. Accurate sales forecasting is certainly an inexpensive way to meet the aforementioned goals, since this leads to improved customer service, reduced lost sales and product returns and more efficient production planning. Especially for the food industry, successful sales forecasting systems can be very beneficial, due to the short shelf-life of many food products and the importance of the product quality which is closely related to human health. In this paper we present a complete framework that can be used for developing nonlinear time series sales forecasting models. The method is a combination of two artificial intelligence technologies, namely the radial basis function (RBF) neural network architecture and a specially designed genetic algorithm (GA). The methodology is applied

successfully to sales data of fresh milk provided by a major manufacturing company of dairy products.
Keywords: Sales forecasting; Dairy products; Fresh milk; Neural networks; Evolutionary computation; Genetic algorithms

Linda M. Reid, Colm P. O'Donnell, Gerard Downey, Recent technological advances for the determination of food authenticity, Trends in Food Science & Technology, Volume 17, Issue 7, July 2006, Pages 344-353, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.01.006.
(http://www.sciencedirect.com/science/article/B6VHY-4JF8H96-1/2/604b2fc3715676cdadd8053bb9a1465e)
Abstract:
The relative potential of various technologies for the confirmation of food authenticity and quality are discussed. Techniques that have found new applications in the field of quality assurance since 2001 are discussed in terms of their potential ease of application in an industrial setting. The use of specific techniques with chemometric analysis for the classification of food samples based on quality attributes is also included in this review. The techniques discussed are spectroscopy (UV, NIR, MIR, visible, Raman), isotopic analysis, chromatography, electronic nose, polymerase chain reaction, enzyme-linked immunosorbent assay and thermal analysis.

Maciej Starzak, Mohamed Mathlouthi, Temperature dependence of water activity in aqueous solutions of sucrose, Food Chemistry, Volume 96, Issue 3, 3rd International Workshop on Water in Foods, June 2006, Pages 346-370, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.02.052.
(http://www.sciencedirect.com/science/article/B6T6R-4GR3434-1/2/19e3bce62656abcedf92925955547ba8)
Abstract:
A comprehensive experimental data analysis was performed to evaluate the effect of temperature on the water activity coefficient and selected excess thermodynamic functions for aqueous solutions of sucrose. A four-suffix Margules equation with temperature-dependent parameters was used to fit thermodynamic data such as the vapor pressure, boiling point, osmotic coefficient, freezing point, sucrose solubility, heat of dilution and specific heat of solution. The proposed equation gives an adequate representation of the available literature data on sucrose solutions for temperatures from -15 to +150 [degree sign]C and sucrose concentrations up to 98% wt. The isotherms of water activity coefficient exhibit a characteristic minimum at about 96% wt. sucrose which is then followed by a dramatic increase to values well exceeding 1, as it was suggested before by some theoretical models [Starzak, M., & Mathlouthi, M. (2002). Water activity in concentrated sucrose solutions and its consequences for the availability of water in the film of syrup surrounding the sugar crystal. Zuckerindustrie, 127, 175-185; Van Hook, A. (1987). The thermodynamic activity of concentrated sugar solutions. Zuckerindustrie, 112, 597-600]. The effect of temperature on water activity, almost negligible for dilute solutions, was found significant for very concentrated solutions (above 80% wt. sucrose). The new water activity equation should find numerous applications in the food technology and sugar industry.
Keywords: Sucrose-water system; Activity coefficient; Margules equation; Temperature dependence; Data regression

, A response to the Institute of Food Technology Annual Meeting in New Orleans 16-20 July, 2005, Food Hydrocolloids, Volume 20, Issue 4, Part Special issue: WCFS Food Summit, June 2006, Pages 548-549, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2005.09.001.
(http://www.sciencedirect.com/science/article/B6VP9-4J5C901-1/2/09b2b71f1566b2b8fba3dc6435f02426)

, Innovative Food Science and Emerging Technologies--Instructions to Authors, Innovative Food Science & Emerging Technologies, Volume 7, Issues 1-2, June 2006, Pages iv-v, ISSN 1466-8564, DOI: 10.1016/S1466-8564(06)00012-9.
(http://www.sciencedirect.com/science/article/B6W6D-4JXB0WW-2/2/7a13842d6c39a4d25fdf4df0c033af43)

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

Maria Teresa Tarrago-Trani, Katherine M. Phillips, Linda E. Lemar, Joanne M. Holden, New and Existing Oils and Fats Used in Products with Reduced Trans-Fatty Acid Content, Journal of the American Dietetic Association, Volume 106, Issue 6, June 2006, Pages 867-880, ISSN 0002-8223, DOI: 10.1016/j.jada.2006.03.010.
(http://www.sciencedirect.com/science/article/B758G-4K0S4FM-K/2/d0bcb51e9b8b101ba30ff5990577ddfd)
Abstract:
The US Food and Drug Administration's final ruling on trans-fatty acid labeling issued in 2003 has caused a rapid transformation in the fat and oil industries. Novel ingredients and improved

technologies are emerging to replace partially hydrogenated fats in foods. We present an overview of the structure and formation of trans fatty acids in foods, and a comprehensive review of the newly formulated products and current procedures practiced by the edible oil industry to reduce or eliminate trans fatty acids in response to the Food and Drug Administration's regulations mandating trans fat labeling of foods.

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)

K.V. Kilimann, C. Hartmann, A. Delgado, R.F. Vogel, M.G. Ganzle, Combined high pressure and temperature induced lethal and sublethal injury of Lactococcus lactis--Application of multivariate statistical analysis, International Journal of Food Microbiology, Volume 109, Issues 1-2, 25 May 2006, Pages 25-33, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2006.01.006.
(http://www.sciencedirect.com/science/article/B6T7K-4JBGHRS-1/2/22624f212119ae76b32fcab0afffad98)
Abstract:
It was the aim of this work to determine the combined effects of pressure, temperature, and co-solutes on Lactococcus lactis, and to detect correlations between culture-dependent and culture-independent methods for assessment of cellular viability and sublethal injury. Therefore, the pressure induced inactivation of L. lactis MG 1363 was investigated in buffer and in buffer with 1.5 M sucrose or 4 M NaCl at a pressure range of 0.1 to 500 MPa and a temperature range of 5 to 50 [degree sign]C. The inactivation was characterised by viable cell counts, stress resistant cell counts, membrane integrity, metabolic activity, and the activity of the multi-drug-resistance transport enzyme LmrP. L. lactis was most resistant to pressure application at 20-30 [degree sign]C. Sucrose protected towards inactivation at any temperature, NaCl provided protection at high temperatures only. By using Principal Component Analysis, correlations were detected between viable cell counts and metabolic activity as well as stress resistant cell counts and LmrP activity. In conclusion, the pressure-inactivation of L. lactis is strongly temperature dependent, baroprotection by sucrose occurs at any temperature but the baroprotective effects of NaCl is temperature dependent. Further on, a combination of two experimental methods fully describe lethal and sublethal injury of pressure treated cells. These simplification of data acquisition and model development facilitates the establishment of pressure processes in food technology.
Keywords: High pressure and temperature treatment; Baroprotection; Principal component analysis

Lynda Kriflik, Consumer citizenship: Acting to minimise environmental health risks related to the food system, Appetite, Volume 46, Issue 3, May 2006, Pages 270-279, ISSN 0195-6663, DOI: 10.1016/j.appet.2006.01.011.
(http://www.sciencedirect.com/science/article/B6WB2-4K1X5BY-1/2/3cba56eba4be96480803b8f4a90c5c54)
Abstract:
Public health practitioners interested in supporting consumers to make healthy, sustainable food choices need to understand consumer motivations to reduce food system risk. Increasingly food technologies that have enhanced access to food supply are being recognised as also impacting on the sustainability of the food system. This study explored the actions taken by Australian participants in response to their concerns about perceived food related threats to health and environment. Variance in willingness to act is analysed within the context of environmental and

ecological citizenship, and a continuum describes the range of positions held. From the outset some participants self-identified as environmentally concerned and proactive, while others indicated a secondary interest in the environment. The catalyst for action for the majority was the priority of individual health and such self-interest can be a powerful motivator for change. Others related health to the environment and described efforts to minimise individual impact. Equally important for action to occur is being at a stage in life where other demands do not compete for the time and energy necessary to take citizenship actions. These results provide insight into the support that public health practitioners can offer to consumers who wish to make sustainable food choices.
Keywords: Environmental health; Consumer citizenship; Food system

Utai Klinkesorn, Pairat Sophanodora, Pavinee Chinachoti, Eric A. Decker, D. Julian McClements, Characterization of spray-dried tuna oil emulsified in two-layered interfacial membranes prepared using electrostatic layer-by-layer deposition, Food Research International, Volume 39, Issue 4, May 2006, Pages 449-457, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.09.008.
(http://www.sciencedirect.com/science/article/B6T6V-4HDP70N-2/2/8df5a327d6fdf37a4d2eada6bc54e95c)
Abstract:
Tuna oil-in-water emulsions containing droplets stabilized by lecithin-chitosan membranes were produced using an electrostatic layer-by-layer deposition process. Corn syrup solids were added to the emulsions and then the emulsions were spray-dried, which produced a powder consisting of spheroid microcapsules (diameter = 5-30 [mu]m) containing tuna oil droplets (diameter <1 [mu]m) embedded within a carbohydrate wall matrix. The powders had relatively low moisture contents (<3%), high oil retention levels (>85%) and rapid water dispersibility (<1 min). The structure of the microcapsules was unaffected by drying temperature from 165 to 195 [degree sign]C. We have demonstrated that a novel interfacial engineering technology, based on production of multilayer membranes around oil droplets, is effective for producing spray-dried encapsulated tuna oil. The powdered tuna oil produced by this method has good physicochemical properties and dispersibility, which may lead to its more widespread utilization as a food additive.
Keywords: Tuna oil; Emulsion; Chitosan; Corn syrup solids; Spray-drying

Hans G.P. Jansen, Angel Rodriguez, Amy Damon, John Pender, Jacqueline Chenier, Rob Schipper, Determinants of income-earning strategies and adoption of conservation practices in hillside communities in rural Honduras, Agricultural Systems, Volume 88, Issue 1, Heterogeneity and Diversity in Less-Favoured Areas, April 2006, Pages 92-110, ISSN 0308-521X, DOI: 10.1016/j.agsy.2005.06.005.
(http://www.sciencedirect.com/science/article/B6T3W-4GTW92J-1/2/88155cb1f4b2ca519035c3e17d627543)
Abstract:
Based on the results of participatory diagnostic surveys conducted in 95 rural communities in the hillsides of Honduras, we determine income earning strategies at the community level; identify their main determinants; and analyze the adoption of of conservation practices. Eight income-earning strategies were distinguished that reflect differences in comparative advantage between communities. We explain the choice of income earning strategy using a multinomial logit model that includes biophysical, economic, social and institutional variables. We use a probit model to show that adoption of conservation practices is determined by the type of income earning strategy, population density, market access, and organizational variables.
Our results have some important policy implications. First, given the higher profitability of cash crops compared to staple foods, significant investments in road infrastructure are needed to better integrate hillside communities into the market economy. Second, while the potential of profitable conservation practices depends on the type of income earning strategy pursued, population

density, market access and assistance from community-based and external organizations play an important role as well. The positive impact of population density on the adoption of many conservation technologies and investments becomes only effective at relatively high levels of population density which most communities in the rural hillsides of Honduras have not yet reached. Finally, given the limited coverage of basic public services such as public health, education, electricity, communication facilities and extension services in many hillside regions, it is imperative to substantially increase the low current levels of public expenditures in these areas. Subsequent research based on detailed household and plot level data from the same communities suggests that investments geared towards improved access to land, education, market access and extension with a focus on soil fertility maintenance have particular potential to raise incomes.
Keywords: Conservation practices; Econometrics; Hillsides; Honduras; Income-earning strategies; Logit; Poverty; Probit; Public expenditure

N.Q. Arancon, C.A. Edwards, P. Bierman, Influences of vermicomposts on field strawberries: Part 2. Effects on soil microbiological and chemical properties, Bioresource Technology, Volume 97, Issue 6, April 2006, Pages 831-840, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.04.016.
(http://www.sciencedirect.com/science/article/B6V24-4GG8VR0-1/2/e945ce3bf08b20b3ea896b11bbfb11aa)
Abstract:
The effects of applications of food waste and paper waste vermicomposts on some soil chemical and biological properties were evaluated in field plots planted with strawberries. Six-week old strawberries (Fragaria ananasa, var. Chandler) were transplanted into 4.5 m2 raised beds under a plastic tunnel structure measuring 9.14 x 14.6 x 3.6 m. Vermicompost were applied at rates of 5 or 10 t ha-1 supplemented with inorganic fertilizers to balance fertilizer recommendations for strawberries of 85-155-125 kg NPK ha-1. Effects of vermicomposts on strawberry growth and yields have been reported previously [Arancon, N.Q., Edwards C.A., Bierman P., Welch, C., Metzger, J.D., 2004. The influence of vermicompost applications to strawberries: Part 1. Effects on growth and yield. Bioresource Technology 93:145-153]. Total extractable N, NH4-N, NO3-N and orthophosphates did not differ significantly between treatments, except on the last sampling date (harvest date) in which significantly greater amounts of NH4-N, NO3-N and orthophosphates (P [less-than-or-equals, slant] 0.05) were recorded in vermicompost-treated soils than in the controls. Two major results of vermicompost applications to soils were increases in dehydrogenase activity and microbial biomass-N which were not dose-dependent. Increased dehydrogenase activity and microbial biomass-N was correlated positively with the increased amounts of NH4-N, NO3-N and orthophosphates in the vermicompost-treated plots than in the controls. Increases in microbial populations and activities are key factors influencing rates of nutrient cycling, production of plant growth-regulating materials, and the build-up of plant resistance or tolerance to crop pathogen and nematode attacks.
Keywords: Vermicompost; Organic amendments; Dehydrogenase activity; Microbial biomass; Soil chemical properties; Soil biological properties

Timothy A. Ebert, Roger A. Downer, A different look at experiments on pesticide distribution, Crop Protection, Volume 25, Issue 4, April 2006, Pages 299-309, ISSN 0261-2194, DOI: 10.1016/j.cropro.2005.06.002.
(http://www.sciencedirect.com/science/article/B6T5T-4GP1V5Y-3/2/37f48f5b131e8e5be7665396bcd776aa)
Abstract:
Experiments on the biological consequences of differences in pesticide distribution include testing differences in application equipment, differences in formulation, and more direct tests of the influence of droplet size, droplet number, or application volume on efficacy for insecticides, herbicides, or fungicides applied as atomized sprays. While these tests have been conducted for

at least 60 years, there are continued calls for improving the efficiency of the application process to address ecological, social, and economic concerns of producers and the public about our food and fiber supply. In designing equipment or formulations to address these issues, we need to understand how droplet size, numbers of droplets, toxicant per droplet, and total dose applied influence efficacy. Our solution involves changing our conceptual and experimental framework from a factorial model to a mixture model, and changing our focus from pest management in the field to an individual pest interacting with one pesticide deposit.
Keywords: Application technology; Experimental design; Mixture design; Insecticides; Fungicides; Herbicides

Tim Kealy, Application of liquid and solid rheological technologies to the textural characterisation of semi-solid foods, Food Research International, Volume 39, Issue 3, April 2006, Pages 265-276, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.07.016.
(http://www.sciencedirect.com/science/article/B6T6V-4H392YG-2/2/49631295f5dcc7f7d48e5000a73d4f75)
Abstract:
Rotational rheometers and texture analysers are commonly used to test liquid and solid samples, respectively. This paper explores data provided by a texture analyser and a rheometer compared with that provided by a trained taste panel for semi-solid food.
Associations are shown to exist for four different types of cream cheese with respect to the findings of a taste panel, rotational rheometry and texture profile analysis (TPA). Hardness, cohesiveness and adhesiveness are discussed for both taste panel and TPA. Good relationships were found between these techniques for hardness and adhesiveness, cohesiveness exhibited a less satisfactory correlation. In the case of the rheometer, yield stress, complex viscosity and viscoelastic moduli were measured. Yield stress was found to relate to hardness and adhesiveness, and complex viscosity and viscous modulus had relevance for cohesiveness. Elastic modulus, measured by the rheometer, and TPA elastic quality also correlated well. The relationships between textural measurements and microstructural engineering of the products have been discussed. The presence of vegetable gums, in particular addition of guar in instances where fat content is low can reduce the textural impact of the fat removal. The effects of high levels of calcium in spreadable products can be reduced by the addition of citric acid, which has been shown in the past to solubilise colloidal calcium phosphate.
Combining instrumental techniques with a taste panel can increase the efficiency product quality assurance and design.
Keywords: Texture profile analysis; Rotational rheometry; Taste panel; Hardness; Cohesiveness; Elastic quality; Viscoelastic moduli; Complex viscosity

L. Olexova, L. Dovicovicova, M. Svec, P. Siekel, T. Kuchta, Detection of gluten-containing cereals in flours and 'gluten-free' bakery products by polymerase chain reaction, Food Control, Volume 17, Issue 3, March 2006, Pages 234-237, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.10.009.
(http://www.sciencedirect.com/science/article/B6T6S-4F14YTN-3/2/af0cd702f47b3e14e9cc9f854f67b42f)
Abstract:
A polymerase chain reaction-based method for the detection of gluten-containing cereals in flours and 'gluten-free' bakery products was optimized and its intralaboratory validation was carried out. The optimized method involved DNA isolation by chaotropic solid-phase extraction and PCR with primers of Dahinden et al. [Dahinden I., von Buren M., Luthy J., 2001. A quantitative competitive PCR system to detect contamination of wheat, barley and rye in gluten-free food for coeliac patients. European Food Research and Technology 212, 228-233]. Using purified DNA, intrinsic detection limit of 42 +/- 12 pg was determined, which corresponds to 10[degree sign] genome copies. By the analysis of a panel of 26 European wheat cultivars and flours from six non-gluten-

containing plants, which are commonly used for the production of gluten-free bakery products, inclusivity of 100% and exclusivity of 100% were determined. By the analysis of model samples of soya flour and cakes, detection limit of 0.1% (w/w) of fine wheat flour was determined, which is suitable for the analysis of 'gluten-free' food products, as it is approximately equivalent to the limit of 10 mg per 100 g for gluten stated by Codex Alimentarius. The method was successfully applied to four samples of flours and 13 brands of biscuits designated 'gluten-free', out of which two flours and one brand of biscuits were found positive for gluten-containing cereals. The method proved to be suitable for routine use, it was relatively straightforward and could be completed in one working day.

M. Ottens, J. Houwing, S.H. Van Hateren, T. Van Baalen, L.A.M. Van der Wielen, Multi-Component Fractionation in SMB Chromatography for the Purification of Active Fractions from Protein Hydrolysates, Food and Bioproducts Processing, Volume 84, Issue 1, March 2006, Pages 59-71, ISSN 0960-3085, DOI: 10.1205/fbp.05185.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVMT-9/2/5b168dbbf3671539ca5a00d576be2c70)
Abstract:
Some separations in food and biotechnology concern enrichment of a (multi-component) product in a particular functionality, for instance from a health or nutritional point of view. For instance, when using chromatography, the functionality can be associated to a particular multi-component fraction of an--also--multi-component feedstock. Developing and optimizing an efficient separation has to deal with the inherent multi-component nature of the feedstock and product(s). Simulated moving bed (SMB) chromatographic separations are known for the efficient separation of well-defined bulk chemicals streams such as binary sugar mixtures or xylene isomers. Therefore, this work is focusing on the feasibility of SMB technology for the group of industrially relevant multi-component separation problems. As a typical example, the feasibility of SMB size exclusion chromatography for the isolation of bioactive components, peptides, capable to inhibit the `angiotensin-converting enzyme' (ACE) from a casein hydrolysate for use in functional foods is investigated.
Fixed bed (FB) experiments were used to select a proper stationary phase (Toyopearls HW40 C), and buffer, and to determine the partitioning coefficients of the key components. Components with a large volumetric partitioning coefficients (K > 0.75) and a low molecular weight proved to have the highest specific bioactivity.
SMB experiments were designed on the basis of measured partitioning coefficients. Three experimental strategies were used to determine the effect of changing ratio of liquid and simulated solid flow rates at constant throughput, a variable throughput and a variable feed concentration, respectively, on the composition, purity and biological activity of the produced fractions, as well as the recovery of the components.
High product purities containing the active fraction (> 98%) could be achieved using SMB. Increasing the liquid flow rate at constant simulated resin flow rate (i.e., constant switch time) and throughput yielded an increase in bioactive product purity at the expense of the product recovery. By increasing the throughput, both the purity and recovery of both products were decreased, due to the inevitable presence of `intermediate components'. A 10-fold decrease in feed concentration had no clear effect on the separation.
Keywords: simulated moving bed chromatography; multi-component separation; protein purification; size exclusion chromatography

Brent A. Anderson, R. Paul Singh, Effective heat transfer coefficient measurement during air impingement thawing using an inverse method, International Journal of Refrigeration, Volume 29, Issue 2, March 2006, Pages 281-293, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2005.05.016.

(http://www.sciencedirect.com/science/article/B6V4R-4GX64VM-5/2/e244215bc6d2eb562ebefaf2b237753b)
Abstract:
Convective heat transfer coefficient is a critical parameter in analyzing heating systems. When air impingement technology is applied to the thawing of frozen foods, the resulting effective heat transfer coefficient becomes quite complicated. The airflow from impingement jets result in heat transfer coefficient that varies with position. In addition, transient thawing results in effective heat transfer coefficient that varies with time and surface temperature. Effective heat transfer coefficients as a function of position and surface temperature were determined using an inverse method for thawing from a single impingement jet. Regularization parameters used in this inverse method were determined using simulated data. Effective heat transfer coefficients tended to increase with time as thawing progressed. Heat transfer coefficients decreased radially, but exhibited secondary maxima at radial distances approximately equal to the nozzle diameter. This inverse method enables estimation of heat transfer coefficient as a function of both time and position.
Keywords: Frozen food; Thawing; Process; Jet; Air; Measurement; Heat transfer coefficient; Produit congele; Decongelation; Procede; Jet; Air; Mesure; Coefficient de transfert de chaleur

Brent A. Anderson, R. Paul Singh, Modeling the thawing of frozen foods using air impingement technology, International Journal of Refrigeration, Volume 29, Issue 2, March 2006, Pages 294-304, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2005.05.003.
(http://www.sciencedirect.com/science/article/B6V4R-4GFCPX4-1/2/2d12f6964bf46dc03efc07c36c4d2b01)
Abstract:
With the continual growth in the use of frozen foods both in retail and in food service, there is a need to develop improved thawing methods. Current methods are often undesirably slow (still air) or are very expensive and cause uneven thawing (microwave). Air impingement technology is one possible method to improve the thawing of frozen foods. The objectives of this research were to develop a two-dimensional model for air impingement thawing frozen foods and to verify the model experimentally. Frozen products were thawed using a laboratory impingement system with a single impingement jet. A simulated meat product (Tylose gel) was used as the test material. Thawing of a Tylose disk (12.7 cm diameter, 1.98 cm thickness) with air at 6 [degree sign]C without impingement required more than 12 h, while thawing under a single impingement jet took less than 3 h, over four times faster. Results from the finite difference model gave good agreement with experimental data. Moisture loss during thawing was typically over-predicted because moisture gain due to condensation was not modeled.
Keywords: Frozen food; Modelling; Process; Thawing; Impingement; Air; Produit surgele; Modelisation; Procede; Decongelation; Jet; Air

Elaine Trujillo, Cindy Davis, John Milner, Nutrigenomics, Proteomics, Metabolomics, and the Practice of Dietetics, Journal of the American Dietetic Association, Volume 106, Issue 3, March 2006, Pages 403-413, ISSN 0002-8223, DOI: 10.1016/j.jada.2005.12.002.
(http://www.sciencedirect.com/science/article/B758G-4JB9X3S-N/2/f2abc4e820501a3aa4663744489ea862)
Abstract:
The human genome is estimated to encode over 30,000 genes, and to be responsible for generating more than 100,000 functionally distinct proteins. Understanding the interrelationships among genes, gene products, and dietary habits is fundamental to identifying those who will benefit most from or be placed at risk by intervention strategies. Unraveling the multitude of nutrigenomic, proteomic, and metabolomic patterns that arise from the ingestion of foods or their bioactive food components will not be simple but is likely to provide insights into a tailored

approach to diet and health. The use of new and innovative technologies, such as microarrays, RNA interference, and nanotechnologies, will provide needed insights into molecular targets for specific bioactive food components and how they harmonize to influence individual phenotypes. Undeniably, to understand the interaction of food components and gene products, there is a need for additional research in the 'omics' of nutrition. It is incumbent upon dietetics professionals to recognize that an individual's response to dietary intervention will depend on his or her genetic background and that this information may be used to promote human health and disease prevention. The objectives of this review are to acquaint nutritional professionals with terms relating to 'omics,' to convey the state of the science to date, to envision the possibilities for future research and technology, and to recognize the implications for clinical practice.

Robert S. Pomeroy, John E. Parks, Cristina M. Balboa, Farming the reef: is aquaculture a solution for reducing fishing pressure on coral reefs?, Marine Policy, Volume 30, Issue 2, March 2006, Pages 111-130, ISSN 0308-597X, DOI: 10.1016/j.marpol.2004.09.001.
(http://www.sciencedirect.com/science/article/B6VCD-4DXC2N0-1/2/a7079c457a6cf9665ce30f0b73fab79c)
Abstract:
This paper presents the results of an analysis to determine the financial and social feasibility of aquaculture technologies for live reef organisms, including food fish and marine ornamentals, as an alternative to wild capture of live reef organisms in nearshore waters in the Indo-Pacific region. The paper provides information and policy guidance for appropriate aquaculture technology application for Indo-Pacific nations, which are the source of most live reef organisms supplied for international trade. Cautionary evidence indicates that, under certain conditions, some forms of small-scale aquaculture of live coral reef organisms can be a useful solution for reducing fishing pressure on coral reefs.
Keywords: Aquaculture; Indo-Pacific; Live Reef Fish Trade; Coral reef conservation

John F. Kennedy, Miao Jin, International Food Information Service, Dictionary of Food Science and Technology, Blackwell Publishing, Oxford, UK (2005) (x+413 pp., [pound sign]75.00, ISBN 1-4051-2505-5)., Carbohydrate Polymers, Volume 63, Issue 2, 3 February 2006, Page 288, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2005.08.033.
(http://www.sciencedirect.com/science/article/B6TFD-4HNSB4W-3/2/621ea754561beffaa15d994d7f2cd7f1)

M. Valero, E. Frances, Synergistic bactericidal effect of carvacrol, cinnamaldehyde or thymol and refrigeration to inhibit Bacillus cereus in carrot broth, Food Microbiology, Volume 23, Issue 1, February 2006, Pages 68-73, ISSN 0740-0020, DOI: 10.1016/j.fm.2005.01.016.
(http://www.sciencedirect.com/science/article/B6WFP-4GFTY93-6/2/6a4346a78aded8fdc6bee75df0592b91)
Abstract:
Possible use of three different essential oil components as natural food preservatives was studied by examining their influence in the kinetics of growth from activated spores of four Bacillus cereus strains in tyndallized carrot broth over the temperature range 5-16 [degree sign]C. Selected low concentrations of carvacrol, cinnamaldehyde, or thymol showed a clear antibacterial activity against B. cereus in the vegetable substrate. The addition of 2 [mu]l cinnamaldehyde or 20 mg thymol to 100 ml of broth in combination with refrigeration temperatures ([less-than-or-equals, slant]8 [degree sign]C) was able to inhibit the outgrowth from activated spores of the psychrotrophic strain INRA TZ415 for at least 60 days, but only cinnamaldehyde did it even at the mild abuse temperature of 12 [degree sign]C. Five microliters of carvacrol per 100 ml of inoculated carrot broth, however, were unable to inhibit bacterial growth at 8 [degree sign]C.

Keywords: Bacillus cereus; Refrigerated minimally processed foods; Hurdle technology; Food preservatives; Essential oil components

B. Hammond, J. Lemen, R. Dudek, D. Ward, C. Jiang, M. Nemeth, J. Burns, Results of a 90-day safety assurance study with rats fed grain from corn rootworm-protected corn, Food and Chemical Toxicology, Volume 44, Issue 2, February 2006, Pages 147-160, ISSN 0278-6915, DOI: 10.1016/j.fct.2005.06.008.
(http://www.sciencedirect.com/science/article/B6T6P-4GV2NS2-4/2/2b270c8a6922565060cd932bde81bc38)
Abstract:
The results of a 90-day rat feeding study with YieldGard(R) (YieldGard Rootworm Corn is a registered trademark of Monsanto Technology, LLC.) Rootworm corn (MON 863) grain that is protected against feeding damage caused by corn rootworm larvae are presented. Corn rootworm-protection was accomplished through the introduction of a cry3Bb1 coding sequence into the corn genome for in planta production of a modified Cry3Bb1 protein from Bacillus thuringiensis. Grain from MON 863 and its near isogenic control were separately formulated into rodent diets at levels of 11% and 33% (w/w) by Purina Mills, Inc. Additionally, six groups of rats were fed diets containing grain from different conventional (non-biotechnology-derived) reference varieties. The responses of rats fed diets containing MON 863 were compared to those of rats fed grain from conventional corn varieties. All diets were nutritionally balanced and conformed to Purina Mills, Inc. specifications for Certified LabDiet 5002. There were a total of 400 rats in the study divided into 10 groups of 20 rats/sex/group. Overall health, body weight gain, food consumption, clinical pathology parameters (hematology, blood chemistry, urinalysis), organ weights, gross and microscopic appearance of tissues were comparable between groups fed diets containing MON 863 and conventional corn varieties. This study complements extensive agronomic, compositional and farm animal feeding studies with MON 863 grain, confirming that it is as safe and nutritious as existing conventional corn varieties.
Keywords: Corn: genetically modified; Corn rootworm-protected; Rat feeding study

, 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.

Mary E. Power, Environmental controls on food web regimes: A fluvial perspective, Progress In Oceanography, Volume 68, Issues 2-4, Marine Ecosystem Structure and Dynamics, February-March 2006, Pages 125-133, ISSN 0079-6611, DOI: 10.1016/j.pocean.2006.02.001.
(http://www.sciencedirect.com/science/article/B6V7B-4JJ2BGH-6/2/824d1da03c8c60593c5a2b990d7e24f1)
Abstract:
Because food web regimes control the biomass of primary producers (e.g., plants or algae), intermediate consumers (e.g., invertebrates), and large top predators (tuna, killer whales), they are

of societal as well as academic interest. Some controls over food web regimes may be internal, but many are mediated by conditions or fluxes over large spatial scales. To understand locally observed changes in food webs, we must learn more about how environmental gradients and boundaries affect the fluxes of energy, materials, or organisms through landscapes or seascapes that influence local species interactions. Marine biologists and oceanographers have overcome formidable challenges of fieldwork on the high seas to make remarkable progress towards this goal. In river drainage networks, we have opportunities to address similar questions at smaller spatial scales, in ecosystems with clear physical structure and organization. Despite these advantages, we still have much to learn about linkages between fluxes from watershed landscapes and local food webs in river networks. Longitudinal (downstream) gradients in productivity, disturbance regimes, and habitat structure exert strong effects on the organisms and energy sources of river food webs, but their effects on species interactions are just beginning to be explored. In fluid ecosystems with less obvious physical structure, like the open ocean, discerning features that control the movement of organisms and affect food web dynamics is even more challenging. In both habitats, new sensing, tracing and mapping technologies have revealed how landscape or seascape features (e.g., watershed divides, ocean fronts or circulation cells) channel, contain or concentrate organisms, energy and materials. Field experiments and direct in situ observations of basic natural history, however, remain as vital as ever in interpreting the responses of biota to these features. We need field data that quantify the many spatial and temporal scales of functional relationships that link environments, fluxes and food web interactions to understand how they will respond to intensifying anthropogenic forcing over the coming decades.
Keywords: Fluxes; Food web controls; Landscapes; Longitudinal gradients; Mapping; Sensing; Tracing technology; Rivers; Seascapes; Watersheds

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.

Ning Wang, Naiqian Zhang, Maohua Wang, Wireless sensors in agriculture and food industry--Recent development and future perspective, Computers and Electronics in Agriculture, Volume 50, Issue 1, January 2006, Pages 1-14, ISSN 0168-1699, DOI: 10.1016/j.compag.2005.09.003.

(http://www.sciencedirect.com/science/article/B6T5M-4HK5SFX-1/2/05c1042245325eb1d9ac1ddc9ffccf68)
Abstract:
This paper presents an overview on recent development of wireless sensor technologies and standards for wireless communications as applied to wireless sensors. Examples of wireless sensors and sensor networks applied in agriculture and food production for environmental monitoring, precision agriculture, M2M-based machine and process control, building and facility automation and RFID-based traceability systems are given. The paper also discusses advantages of wireless sensors and obstacles that prevent their fast adoption. Finally, based on an analysis of market growth, the paper discusses future trend of wireless sensor technology development in agriculture and food industry.
Keywords: M2M; ZigBee; Bluetooth; RFID

Miguel Herrero, Alejandro Cifuentes, Elena Ibanez, Sub- and supercritical fluid extraction of functional ingredients from different natural sources: Plants, food-by-products, algae and microalgae: A review, Food Chemistry, Volume 98, Issue 1, 2006, Pages 136-148, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.05.058.
(http://www.sciencedirect.com/science/article/B6T6R-4GRH7CB-6/2/722a7bc3200d658acee89335b1d78df6)
Abstract:
The increasing interest of consumers in functional foods has brought about a rise in demand for functional ingredients obtained using 'natural' processes. In this review, new environmentally clean technologies for producing natural food ingredients are discussed. This work provides an updated overview on the principal applications of two clean processes, supercritical fluid extraction and subcritical water extraction, used to isolate natural products from different raw materials, such as plants, food by-products, algae and microalgae. Although the extraction of some compounds with antibacterial, antiviral or antifungical activity is discussed, special attention is paid to the extraction of antioxidant compounds, due to their important role in food preservation and health promotion.
Keywords: Algae; Antioxidant; Food by-products; Functional foods; Microalgae; Nutraceuticals; Subcritical water extraction; Supercritical fluid extraction; Plants

Gabriella Caporale, Sonia Policastro, Angela Carlucci, Erminio Monteleone, Consumer expectations for sensory properties in virgin olive oils, 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 116-125, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2005.07.011.
(http://www.sciencedirect.com/science/article/B6T6T-4H0YYXS-1/2/2babb0c81a8a4813dafd30f69f2534d6)
Abstract:
Information has been shown to create expectations concerning sensory properties and acceptability of food products, and to influence their evaluations. Studying the impact of information is particularly relevant for traditional products which communicate about typicality. Extra virgin olive oil is a typical Mediterranean production whose typicality is strongly affected by the origin of its raw material and the manufacturing technology. The present study aims (1) to explore the appropriateness of several sensory descriptors in evaluating the typicality of certain extra virgin olive oils, (2) to assess the impact of information about the origin of the product on the sensory profile perception, (3) to study how the effect of sensory expectations can influence liking and 'typicality' responses for the experimental oils obtained from a defined cultivar. Working with a panel of consumers familiar with several typical extra virgin olive oils produced in Lucania, a set of monovarietal extra virgin olive oils were evaluated. Results show that there are well defined expectations for some of the sensory properties which characterize the typical olive oils presented.

The sensory disconfirmations leading to complete assimilation in sensory perception are associated to higher 'typicality' ratings. Our results also revealed that bitterness and pungency proved to be the most appropriate sensory descriptors of certain typical olive oils.
Keywords: Olive oil; Appropriateness test; Typicality; Expectations; Origin

Sara R. Jaeger, Non-sensory factors in sensory science research, 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 132-144, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2005.03.004.
(http://www.sciencedirect.com/science/article/B6T6T-4G1R3PM-1/2/e880df87ca3020fbac2fb566b55123c3)
Abstract:
Decisions about what food to buy, eat and serve for one's family and friends are complex and influenced by many factors other than sensory quality. It is widely agreed that while taste and other sensory qualities are very important, they only partially account for consumers' food related behaviours. This paper considers the role of several other factors: convenience, price, production technology, personal health, branding, and societal issues. As opposed to an in-depth review of each of the selected factors, the complex nature of food choice and behaviour and the influence that non-sensory factors can exert are considered. A methodology for researching these complex topics emerges from the examples presented. It builds on three premises: (i) multi-method and interdisciplinary approaches are needed to research peoples' relationships with food; (ii) using tools and techniques that are tailored to food-related research; and (iii) not taking account of context threatens the validity of food-related research.
Keywords: Convenience; Price; Production technology; Personal health; Branding; Societal issues; Contextual influences; Research methodology

Imane Tahiri, Joseph Makhlouf, Paul Paquin, Ismail Fliss, Inactivation of food spoilage bacteria and Escherichia coli O157:H7 in phosphate buffer and orange juice using dynamic high pressure, Food Research International, Volume 39, Issue 1, January 2006, Pages 98-105, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.06.005.
(http://www.sciencedirect.com/science/article/B6T6V-4GWC0RP-1/2/707e71aafbe2355539bab2756b8056d8)
Abstract:
This study aimed to evaluate the potential of dynamic high pressure (DHP) technology to inactivate pathogenic and spoilage microflora in orange juice. Escherichia coli O157:H7 ATCC 35150, Lactobacillus plantarum ATCC 14917, Leuconostoc mesenteroides ATCC 23386 and two orange juice isolates: Saccharomyces cerevisiae and Penicillium ssp. were subjected individually to different DHP treatments. The effectiveness of DHP treatment was first evaluated in phosphate buffered saline (PBS) before application in orange juice samples. The inactivation efficacy of DHP depended on the pressure applied and the number of passes. It was more efficient against Gram-negative strains than Gram-positives. Complete inactivation and 5 log reduction of E. coli O157:H7 were achieved in orange juice at 200 MPa after 5 and 3 passes at 25 [degree sign]C, respectively. Lower inactivation was obtained with Penicillium ssp. (4 log), S. cerevisiae (2.5 log), L. plantarum (2.3 log) and L. mesenteroides (1.6 log). The gathered results revealed the potential of DHP to inactivate all the tested microorganisms and then, it could constitute a promising alternative technology for cold pasteurization of fruit juices.
Keywords: Dynamic high pressure; Orange juice; Bacterial inactivation; E. coli O157:H7; Yeasts; Moulds; Lactic acid bacteria

Ales Landfeld, Milan Houska, Prediction of heat and mass transfer during passage of the chicken through the chilling tunnel, Journal of Food Engineering, Volume 72, Issue 1, January 2006, Pages 108-112, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.11.022.
(http://www.sciencedirect.com/science/article/B6T8J-4F29SP3-1/2/d7909977c07ba076fc6212a46bcf88f2)
Abstract:
This work contains the results of mathematical modelling of heat and mass transfer during chilling of chicken in a cooling tunnel. Experimental data were obtained by measurements conducted on equipment of one of the domestic chilled poultry producers. The mathematical modelling employed codes Bertix (TNO-MEP, Holland) and Food Product Modeller (Mirinz, Food Technology and Research Ltd, New Zealand). The results are coefficients of heat and mass transfer, typical for the particular poultry chilling technology.
Keywords: Chicken; Chilling; Heat transfer; Mass transfer; Mathematical model

Clare Hall, Dominic Moran, Investigating GM risk perceptions: A survey of anti-GM and environmental campaign group members, Journal of Rural Studies, Volume 22, Issue 1, January 2006, Pages 29-37, ISSN 0743-0167, DOI: 10.1016/j.jrurstud.2005.05.010.
(http://www.sciencedirect.com/science/article/B6VD9-4GJKTRW-1/2/abb2ef27108390de85ce456fc3f0c05e)
Abstract:
This study investigates how members of anti-GM campaign groups and environment groups perceive the risks and benefits of genetically modified (GM) technology in food and agriculture. The study targeted these groups as the most risk-averse sector of society when considering GM technology. Survey respondents were asked to rank the current and future risks and benefits of GM and to rank GM risks against other health risks. Respondents appear to be unconvinced by the claims that future GM technologies will provide additional consumer (or environmental) benefit, since perceived future risks were ranked more highly than future benefits. Results support the claim that there is an inverse relationship between perceived risk and perceived benefit. Results also suggest that among the respondents there are differences of opinion regarding the degree of risk to health posed by the technology. Women and people living in rural areas, on average, ranked risks more highly than men and people living in urban areas. This study serves to fill a void in the understanding of the perceptions of anti-GM campaigners.

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.M. Commandeur, Diversity of pig farming styles: understanding how it is structured, NJAS - Wageningen Journal of Life Sciences, Volume 54, Issue 1, 2006, Pages 111-127, ISSN 1573-5214, DOI: 10.1016/S1573-5214(06)80007-2.
(http://www.sciencedirect.com/science/article/B94T2-4WFBS5K-7/2/d13e089adf0d4ca613821f56e865d232)
Abstract:
Modern pig farmers work with a variety of objectives they apply to their current situation and future insecurities. They face the daily realities of managing their herd, organizing their time and resources and gaining an income, realities that have been shaped by the past. Supported by technology this daily reality is constantly progressing towards further increase of intensity and scale. The future is unpredictable and not promising. Falling prices, increased risks of disease outbreaks, food quality problems and conflicting interests of consumer demands, all help create uncertainty. Where do farmers take a stand in this turbulent environment? Field surveys have revealed that there is no single answer. Depending on their ambition for revenues and development and on their rationale for the current condition of the farm, farmers hold a variety of positions. There are various styles of farming. Each style represents a specific and integral logic in relation to their ambition and rationale. Farmers express their dominant logic in their specific objectives and strategies. Using results from field research in the Netherlands this paper illustrates what styles of farming mean, how they relate to management indicators, what relevance they have to diversifying and expanding markets and the opportunities and risks these present.
Keywords: sociological analysis; disease management

Liyun Zheng, Da-Wen Sun, Innovative applications of power ultrasound during food freezing processes--a review, Trends in Food Science & Technology, Volume 17, Issue 1, January 2006, Pages 16-23, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.08.010.
(http://www.sciencedirect.com/science/article/B6VHY-4HDX6P7-3/2/77fc0c7c2a3921d140d6ec330f925fd3)
Abstract:
Although the application of power ultrasound to food freezing is a relatively new subject, recent research advances show its potential is promising. The beneficial use of the sound energy is realised through the various effects that ultrasound generates upon the medium where it transmits. Among them, cavitation is perhaps the most significant one, which can not only lead to the production of gas bubbles but also the occurrence of microstreaming. The former can promote ice nucleation while the latter is able to accelerate the heat and mass transfer process accompanying the freezing process. Similar to other dense and incompressible materials, ice crystals will fracture when subjecting to alternating acoustic stress, consequently leading to products of smaller crystal size distribution, which is indeed one of the most important aspects that many freezing processes target at.
Resulting from these acoustic effects, the application of power ultrasound is beneficial to many food-freezing processes. If ultrasound is applied to the process of freeze preservation of fresh foodstuffs, it can shorten the freezing process, and lead to product of better quality. If it is applied to freeze concentration and freeze drying processes, it can be used to control crystal size distribution in the frozen product. Furthermore, power ultrasound can also bring several benefits to the process of partial freezing of ice cream inside a scraped surface freezer, e.g. reducing crystal

size, preventing incrustation on freezing surface, etc. Therefore, ultrasonic freezing process could have promising applications in freezing of high value food (ingredients) and pharmaceutical products.
However, for the future development of this technology, several problems still remain to be explored. More fundamental research is still needed in order to identify factors that affect the ability of power ultrasound in performing the above functions. Considerable research effort is also required with regards to the development of adequate industrial equipment.

Peter J. Cranford, Shelley L. Armsworthy, Ole A. Mikkelsen, Timothy G. Milligan, Food acquisition responses of the suspension-feeding bivalve Placopecten magellanicus to the flocculation and settlement of a phytoplankton bloom, Journal of Experimental Marine Biology and Ecology, Volume 326, Issue 2, 13 December 2005, Pages 128-143, ISSN 0022-0981, DOI: 10.1016/j.jembe.2005.05.012.
(http://www.sciencedirect.com/science/article/B6T8F-4GGXXHB-3/2/ade626666211716b750ed662062e9f59)
Abstract:
In situ technologies were employed to monitor suspended particle flocculation and floc settlement and utilization by a cohort of sea scallops (Placopecten magellanicus) during the 2000 spring phytoplankton bloom in Bedford Basin, Nova Scotia, Canada. The objectives were to determine the effect of bloom flocculation and settling on food acquisition and utilization by scallops, and to assess the potential role of flocculation in enhancing the bioavailability of trophic resources and particle-reactive contaminants to bivalve filter feeders. The development and flocculation of the phytoplankton bloom were monitored within the surface layer (10 m depth) by in vivo chlorophyll fluorescence and silhouette camera observations. Sedimentation rate, seston abundance and composition, and sea scallop functional responses were monitored at 20 m depth (below the bloom) to provide insight into the potential forcing of feeding and digestion processes by changes in the abundance, composition and properties of the ambient food supply. The bloom began in mid-March and median floc diameter at 10 m depth increased rapidly from 200 [mu]m to greater than 400 [mu]m between 21 and 28 March. Flocs were observed to be abundant in the surface layer up to 4 April. Daily vertical particle flux was high during the last week of March and declined to near zero by 1 April. Clearance rates of scallops held at 20 m depth were relatively high (average +/- S.D.; 11.7 +/- 4.0 L h- 1) during the period of bloom settlement and declined rapidly to low levels (0.4 +/- 0.9 L h- 1) after 31 March. Average absorption efficiency also declined (0.88 +/- 0.01 to 0.78 +/- 0.05) after bloom settlement. Daily biodeposition rates by scallops were poorly correlated with temporal variations in the quantity (total particulate matter and chlorophyll a concentration) or quality (organic content) of seston available to the scallops, but were significantly correlated with sedimentation rate. Comparison of disaggregated inorganic particle size distributions for suspended particulate matter, settled particles, and scallop feces indicated that fine-grained particles (1 to 4 [mu]m) were effectively ingested by sea scallops--an indication of whole floc ingestion. The settlement of flocs produced during the spring bloom appears to be important in regulating this species physiological energetics and for enhancing the bioavailablility of fine particles (including picoplankton) and particle-reactive contaminants.
Keywords: Ecophysiology; Flocculation; Phytoplankton bloom; Placopecten magellanicus; Scallops; Suspension-feeding

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

Loong-Tak Lim, Food Packaging Technology edited by R. Coles/D. McDowell/ M.J. Kirwan, Published by Blackwell Publishing Ltd and CRC Press (ISBN 1-84127-221-3/0-8493-9788-X)., Trends in Food Science & Technology, Volume 16, Issue 12, December 2005, Pages 574-575, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.08.005.
(http://www.sciencedirect.com/science/article/B6VHY-4H99JD3-1/2/0f0667884b0b8b94dcace82ef6172b47)

N. Papandroulakis, C.C. Mylonas, E. Maingot, P. Divanach, First results of greater amberjack (Seriola dumerili) larval rearing in mesocosm, Aquaculture, Volume 250, Issues 1-2, 14 November 2005, Pages 155-161, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2005.02.036.
(http://www.sciencedirect.com/science/article/B6T4D-4FR3N84-3/2/78705839009ad65b7ed60964212c1373)
Abstract:
Species diversification is considered a major approach for the sustainable development of aquaculture. The greater amberjack (Seriola dumerili) has particular characteristics-advantages making it an appropriate candidate: high growth rate, large size, and established worldwide market. In the present study, the mesocosm method for larval rearing was applied, since it has been shown to be effective in the larval rearing of several species so far. This method is a semi-intensive technology, based on daily exogenous food addition, but also having the capacity of some endogenous productivity. Greater amberjack eggs were obtained from wild-caught fish matured in captivity in 6 years, after induced spawning with implants containing gonadotropin-releasing hormone agonist (GnRHa). A total of 9800 eggs survived after embryo appearance and were incubated in a 40-m3 tank with natural seawater of 40 psu. Rearing lasted 40 days. After mouth opening on day 2 post hatching, exogenous feeding with rotifers, Artemia nauplii and inert feed was initiated, while endogenous produced copepods contributed as food for the larvae from day 7 post hatching onwards. During rearing, larvae grew with an exponential rate of 0.073 day-1 in terms of total length (TL), and reached 39.9 +/- 5.4 mm and 0.5 +/- 0.1 g body weight at the end of the trial. All larvae inflated their swim bladder and completed metamorphosis at about 5 mm and 8 mm TL, respectively. Schooling behavior was first observed when larvae reached 9-10 mm TL, while aggression against the smallest individuals was first noticed the same period. The final population of about 350 individuals (3.5% survival) was transferred at the end of the trial for subsequent on-growing. The results obtained indicate the reliability of the technology for the larval rearing of the greater amberjack, and also its appropriateness for diversification with difficult marine species.
Keywords: Seriola dumerili; Mesocosm

M.A. Keyzer, M.D. Merbis, I.F.P.W. Pavel, C.F.A. van Wesenbeeck, Diet shifts towards meat and the effects on cereal use: can we feed the animals in 2030?, Ecological Economics, Volume 55, Issue 2, 1 November 2005, Pages 187-202, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2004.12.002.
(http://www.sciencedirect.com/science/article/B6VDY-4FN76SB-2/2/094b2125c50107143bca20f185213fb0)
Abstract:
The paper argues that current international projections of meat and feed demand may underestimate future consumption patterns, for mainly two reasons: demand projections are based on income extrapolation with an assumed demand elasticity and feed requirements per unit of meat are taken to be fixed. Instead, we propose a structural specification that includes a dietary shift towards meat as per capita income increases, and we account for a shift from traditional to cereal intensive feeding technologies. Our finding is that under the commonly assumed growth rates of per capita income, world cereal feed demand will be significantly higher in the coming 30 years than is currently projected by international organizations, even if we allow for price effects. Compared to other factors that are generally expected to affect the future world food situation, the quantitative impact of the increased cereal feed demand greatly exceeds that of GMOs and climate change in the coming three decades.
Keywords: Food consumption pattern; Meat demand; Dietary change; Cereal feed demand; Land use

C. de Swarte, R.A. Donker, Towards an FSO/ALOP based food safety policy, 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 825-830, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.10.023.
(http://www.sciencedirect.com/science/article/B6T6S-4F53N5M-4/2/2d97e8ad561d30bfab54773e5b9b2b26)
Abstract:
To gain more insight in the possible process of setting a food safety objective (FSO), a concept developed by Codex Alimentarius for microbial hazards, in national food safety policy, a study was executed in the Netherlands. This Dutch study consisted of a case study regarding the process of setting a FSO for a chemical and for a microbiological hazard as well as of a theoretical study concerning the possible development of new decision-making tools. The study resulted in a model for a decision-making process that integrates life sciences, socio-economical studies and technology assessment. It also features close interaction between policymakers and researchers. As a result of the study, it is advised to install an independent advisory committee that helps government in deciding on appropriate levels of protection of the population and setting FSOs.
Keywords: Food safety objectives; Public policy; Consumer protection

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

A.E.D. Bekhit, C. Faustman, Metmyoglobin reducing activity, Meat Science, Volume 71, Issue 3, November 2005, Pages 407-439, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.04.032.
(http://www.sciencedirect.com/science/article/B6T9G-4GHSGW9-1/2/da5a95745c7455259bc2989967460f0b)
Abstract:
Meat colour is a major factor that influences the purchase decision by consumers. Many intrinsic and extrinsic factors contribute to the final colour of meat. The role of the MetMb reducing system in maintaining meat colour has been controversial and a considerable amount of work has been published since [Giddings, G. G., 1974. Reduction of ferrimyoglobin in meat. CRC Critical Reviews in Food Technology 5, 143-173] classic review. Historically, the activity of MetMb reductase was classified under different names, for example, diaphorases, aerobic and anaerobic reducing systems, cytochrome b5 MetMb reductase, and NADH dependent metmyoglobin reducing enzyme system. Several techniques have been proposed to measure the enzyme activity including reflectance spectrophotometry and absorbance spectrophotometry. However, the variations in the reductase systems and techniques used to measure them have yielded inconsistent results from different investigators. This review seeks to characterize the current understanding of metmyoglobin reduction in meat especially with reference to recent developments in this area. Because many systems (different enzymatic systems and non-enzymatic systems) have been reported to reduce MetMb, the term MetMb reductase is not appropriate to be used to reflect 'the MetMb reducing activity' in meat. The need for a standardized approach for measuring MetMb reduction is discussed in order for future research to ensure a greater understanding of this important reaction.
Keywords: Cytochrome b5; Meat colour; Metmyoglobin reductase; Oxymyoglobin

Are Hugo Pripp, Tomas Isaksson, Leszek Stepaniak, Terje Sorhaug, Ylva Ardo, Quantitative structure activity relationship modelling of peptides and proteins as a tool in food science, Trends in Food Science & Technology, Volume 16, Issue 11, November 2005, Pages 484-494, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.07.003.
(http://www.sciencedirect.com/science/article/B6VHY-4H16NYY-1/2/96c0c4e71832d3576f190e77cc0efd98)
Abstract:
Peptides and proteins contribute to physical properties, biological activities and sensory characteristics of foods. Studies on the isolation and characterisation of peptides and proteins allow compilation of data sets on their structures and properties/activities. Quantitative structure activity relationship (QSAR) modelling provides methodology to find mathematical expressions for such relationships which may then be useful for estimating activities of any related compound and for predicting structures of high activity. Methodology for transforming peptide and protein structures into data sets are presented, and research relevant for food science and technology are discussed in this review. Peptide QSAR modelling has been especially useful for antimicrobial,

ACE-inhibitory and bitter tasting peptides, but could easily be expanded to other areas within food research.
Keywords: QSAR; Bioactive peptides; Protein; Food; Milk

, Trends in Food Science and Technology--Vol. 15 (2004)Author Index, Trends in Food Science & Technology, Volume 16, Issue 11, November 2005, Pages 519-527, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.09.003.
(http://www.sciencedirect.com/science/article/B6VHY-4HBSGWD-1/2/0f3c9adc588d55c067ff2aaee50e5b1c)

F. Pfister, H.-P. Bader, R. Scheidegger, P. Baccini, Dynamic modelling of resource management for farming systems, Agricultural Systems, Volume 86, Issue 1, October 2005, Pages 1-28, ISSN 0308-521X, DOI: 10.1016/j.agsy.2004.08.001.
(http://www.sciencedirect.com/science/article/B6T3W-4DFBVGW-2/2/7f4377aceaa519a5ec3d66c2506e87f8)
Abstract:
With the rapid development of computer technology, numerous simulation models have been developed for agricultural systems and farms. Nevertheless, most of them are rather appropriate for developed countries as they have considerable data requirements and often aim at optimizing farm resources, excluding the farmer's household from the system. Yet, the latter is crucial for the understanding of semi-subsistence systems such as those found in developing countries.
We present a dynamic model of an agricultural system in the Central Highlands of Nicaragua. It aims at giving a deeper insight into the functioning of the system and the constraints the latter is subject to. Such an approach helps to explain why farmers make certain choices. Although for the study area few data are available, a robust model with a one-day resolution could be designed.
For simulation two groups of scenarios were chosen:
(a) Minimum farm sizes for the production of a certain food supply (e.g. basic staples) were assessed and the impact of increased fertilizer use was estimated. (b) Monoculture farms were simulated with the main crops of the region. The production of calories, protein and added value were chosen as indicators.
We determined the labour requirements for both groups of scenarios.
Simulation results show that the latter is a limiting factor. This is true even for farming systems aiming at covering minimum needs (food, elemental health care and schooling) only. We can show that farmers' strategies (e.g. crop mix, fertilizer application) are crucial for the system. Last but not least, we produce some evidence for the advantage of the current crop mix in the study region.
Keywords: Resource management; Simulation; Farming systems; Nicaragua

A. Huotilainen, H. Tuorila, Social representation of new foods has a stable structure based on suspicion and trust, Food Quality and Preference, Volume 16, Issue 7, October 2005, Pages 565-572, ISSN 0950-3293, DOI: 10.1016/j.foodqual.2005.01.001.
(http://www.sciencedirect.com/science/article/B6T6T-4FFGJGP-2/2/4c9aaa41b8b9a913330962fcc67b790a)
Abstract:
Three data sets, collected in 2001 (N = 734), 2002 (N = 1156), and 2004 (N = 1113), were compared to verify the structure and identify changes in the social representation (SR) of new foods in Finland, based on a 27-item questionnaire. The three data sets indicated a great stability of five SR components: suspicion of new foods, adherence to technology, adherence to natural food, eating as an enjoyment, and eating as a necessity. Drawn on the relationships between these components, it is suggested that the stable core of the SR is trust, as a counterpart of suspicion. Adherence to natural food and adherence to technology are the opposite themata organized around this core. While the core elements are stable, individual variation is expressed in

relation to the measurable five components. Applying the SR theory in the food domain brings added value to current thinking of new foods as it enables theoretical organization of their social concepts.
Keywords: New foods; Social representations

M. Arlorio, J.D. Coisson, F. Travaglia, F. Varsaldi, G. Miglio, G. Lombardi, A. Martelli, Antioxidant and biological activity of phenolic pigments from Theobroma cacao hulls extracted with supercritical CO2, Food Research International, Volume 38, Issues 8-9, Third International Congress on Pigments in Food, October-November 2005, Pages 1009-1014, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.03.012.
(http://www.sciencedirect.com/science/article/B6T6V-4GHSGGH-2/2/ded69886bdca198fe25747755a3b13c6)
Abstract:
Theobroma cacao L. (Sterculiaceae) and cocoa-derived products are phenolics-rich food; these products are largely studied because of the antioxidant and antiradical in vitro properties of phenolic constituents. Cocoa hulls are the principal by-product of cocoa, separated from the cotyledons during the pre-roasting process or after the roasting process of T. cacao beans (de-hulling/de-husking step). This by-product is a matrix rich in fiber (namely insoluble, but also represented by pectins) and phenolics. Supercritical CO2 is a powerful mild technology able to extract and fractionate from plant or animal foods without the use of organic solvent. This approach was used to extract some phenolics fractions from cocoa hulls. Only two recovered fractions, (150 bar, 50 [degree sign]C, re-dissolved in acetone; 200 bar, 50 [degree sign]C, re-dissolved in acetone), apparently free from (-)epicatechin, catechin and phenolic acids, showed protective action in an in vitro test (SH-SY5Y cells, differentiated to a neuronal phenotype using retinoic acid and then exposed to ischemic damage), similar to the action of cabergoline and vitamin E. We suggest the use of supercritical CO2 for the isolation of bioactive fractions from cocoa hulls and an in vitro model as a useful model to study the antioxidant/antiradical properties of isolated phenolic pigments.
Keywords: Theobroma cacao L.; Antioxidant; Antiradical; Phenolics; Supercritical CO2 extraction

R.J. Weselake, In: K.R. Kanes, Editor, Fats in food technology, Sheffield Academic Press, Sheffield, UK (2002) ISBN 1-84127-225-6 (379pp, price 99!)., International Dairy Journal, Volume 15, Issue 10, October 2005, Pages 1086-1087, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2005.03.001.
(http://www.sciencedirect.com/science/article/B6T7C-4G9GN69-1/2/dcc5a68738293f524782903857ed627c)

Martin Butler, Pat Herlihy, Peter B. Keenan, Integrating information technology and operational research in the management of milk collection, Journal of Food Engineering, Volume 70, Issue 3, Operational Research and Food Logistics, October 2005, Pages 341-349, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.02.046.
(http://www.sciencedirect.com/science/article/B6T8J-4DWH268-1/2/73f0f2acd712f02de5d42fb66af46008)
Abstract:
The dairy industry is an important part of the food sector and milk collection is a challenging logistics problem that had long been of interest to operational researchers. Advances in information technology (IT) greatly facilitate data collection, manipulation and presentation and these advances facilitate the building of decision support systems (DSS) to support logistics management in the milk collection sector. This paper discusses how a geographic information system (GIS) based DSS allows a scheduler interact with optimisation algorithms to plan milk collection routes. The paper goes on to discuss how such a DSS can be integrated with automatic

data capture devices and database management systems to provide effective management of milk collection operations.

Patroklos Georgiadis, Dimitrios Vlachos, Eleftherios Iakovou, A system dynamics modeling framework for the strategic supply chain management of food chains, Journal of Food Engineering, Volume 70, Issue 3, Operational Research and Food Logistics, October 2005, Pages 351-364, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.06.030.
(http://www.sciencedirect.com/science/article/B6T8J-4DW8XKH-2/2/dcb2b29360695562b168e4986ea1e466)
Abstract:
The need for holistic modeling efforts that capture the extended supply chain enterprise at a strategic level has been clearly recognized first by industry and recently by academia. Strategic decision-makers need comprehensive models to guide them in efficient decision-making that increases the profitability of the entire chain. The determination of optimal network configuration, inventory management policies, supply contracts, distribution strategies, supply chain integration, outsourcing and procurement strategies, product design, and information technology are prime examples of strategic decision-making that affect the long-term profitability of the entire supply chain. In this work, we adopt the system dynamics methodology as a modeling and analysis tool to tackle strategic issues for food supply chains. We present guidelines for the methodology and present its development for the strategic modeling of single and multi-echelon supply chains. Consequently, we analyze in depth a key issue of strategic supply chain management, that of long-term capacity planning. Specifically, we examine capacity planning policies for a food supply chain with transient flows due to market parameters/constraints. Finally, we demonstrate the applicability of the developed methodology on a multi-echelon network of a major Greek fast food chain.
Keywords: System dynamics; Supply chain management; Food logistics; Capacity planning

N. Prindezis, C.T. Kiranoudis, An internet-based logistics management system for enterprise chains, Journal of Food Engineering, Volume 70, Issue 3, Operational Research and Food Logistics, October 2005, Pages 373-381, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.01.040.
(http://www.sciencedirect.com/science/article/B6T8J-4DWVXY1-1/2/5b1d1300b5696fcd41c0de765bacc6d1)
Abstract:
This paper presents an Internet-Based Logistics Management System to coordinate and disseminate tasks and related information for solving the heterogeneous vehicle routing problem using appropriate metaheuristic techniques, for use in enterprise chain networks. Its architecture involves a JAVA Web applet equipped with interactive communication capabilities between peripheral software tools. The system was developed in distributed software fashion technology for all computer platforms utilizing a Web browser, focusing on the detailed road network of Athens and the needs of the Athens Central Food Market enterprises.
Keywords: Decision support system; e-Logistics; Transportation; Vehicle routing problem

Ingrid Hunt, Brian Wall, Hari Jadgev, Applying the concepts of extended products and extended enterprises to support the activities of dynamic supply networks in the agri-food industry, Journal of Food Engineering, Volume 70, Issue 3, Operational Research and Food Logistics, October 2005, Pages 393-402, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.06.031.
(http://www.sciencedirect.com/science/article/B6T8J-4G24X71-1/2/95a6c7206784406bf67ee83858c7a662)
Abstract:
During the last decade industry focus has been on the development and integration of processes in the context of the food supply chain. As a result, the food supply chain can be considered highly

integrated where information technology streamlines the use of data and information. Presently the focus is shifting to the supply chain that sits in front of the food industry; the animal feed supply chain. The idea is to integrate all the processes within this supply chain and to connect the two supply chains (food and feed) in such a way that processes that cross-boundaries are completely integrated. In response to this, business strategies must now focus not only on traditional economical and technological interests, but also on topical issues such as safety of food and animal feed products, environmentally friendly production and still provide consumers with safe, quality and inexpensive food.

This paper introduces the agri-food industry concentrating specifically on the animal feed and food industries. It presents the business processes, strategies, and activities in supply chain management that are acting as an antecedent factor in the adoption and participation of eBusiness. The paper will also introduce eBusiness models for these industries and the implication of these models is that over time, the organisation will learn more about the external and internal environments in which its supply chain operates its own and its partners business, and the key functional areas associated with their business. As a result, the organisation will focus more on their business and eBusiness strategies and co-operate with its partners in identifying areas, which need improving across their supply chain.

Keywords: eBusiness; Supply chain management (SCM); Roadmap; Dynamic supply network

Eleni Mangina, Ilias P. Vlachos, The changing role of information technology in food and beverage logistics management: beverage network optimisation using intelligent agent technology, Journal of Food Engineering, Volume 70, Issue 3, Operational Research and Food Logistics, October 2005, Pages 403-420, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.02.044.
(http://www.sciencedirect.com/science/article/B6T8J-4F08556-1/2/8f62b927accd70865fbc2c67047e6514)

Abstract:

The last decades, advances in information technologies and increased competition have changed the business environment in the food and beverages industry, particularly in the European Union, which is characterised by the proliferation of small and medium enterprises. Many food companies are now aggressively focusing on logistics management as the last frontier to gain and sustain a competitive advantage.

This study describes a model of intelligent food supply chain that improves efficiency within the supply chain. The aim of the paper is to demonstrate that agent technology can optimise food supply chains by (a) reviewing intelligent agents applications for supply chain optimisation and (b) illustrating how a multi-agent system can optimise performance of a beverage logistics network. Firstly, we review and synthesise existing applications in comparison to traditional and Internet-based technologies and critically evaluate agent technology applicability for supply chain management. We model the beer supply network to demonstrate that products can acquire intelligence to direct themselves throughout the distribution network. Optimisation agents can help solve specific problems of beverage supply: reduce inventories and lessen bullwhip effect, improve communication, and enable chain coordination without adverse risk sharing. Further, they gain a capability to be purchased and sold while in transit.

Overviews of the supporting technologies that make such a supply chain a reality are fully discussed. In particular, optimisation agents have the characteristics of autonomous action, being proactive, reactive, and able to communicate. We demonstrate that agents enhance the flexibility, information visibility, and efficiency of the supply chain management. Suggestions and recommendations for further research are provided. Simulations of the agent-enabled supply optimisation can be used to benchmark for future research and development associated with building an optimisation agent.

Keywords: Intelligent agents; Beverage network optimisation food logistics; Supply chain management

G.S. Mittal, Robert J. Whitehurst, Editor, Emulsifiers in Food Technology, Blackwell Publishing Ltd, Oxford, UK (2004) ISBN 1-4051-1802-4 hardback, $189.99, 264 pages, 112 illustrations, 15 authors, 10 chapters and 4 appendices., Trends in Food Science & Technology, Volume 16, Issue 10, October 2005, Page 475, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.02.005.
(http://www.sciencedirect.com/science/article/B6VHY-4G4N5R4-2/2/01c567f31435e5a7f220c3a3a74fb4f4)

, Trends in Food Science and Technology, Trends in Food Science & Technology, Volume 16, Issue 10, October 2005, Pages 479-480, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.09.002.
(http://www.sciencedirect.com/science/article/B6VHY-4H5MYHH-2/2/108c0cc609aa980343dff7144b9af8f6)

Melba G. Bondad-Reantaso, Rohana P. Subasinghe, J. Richard Arthur, Kazuo Ogawa, Supranee Chinabut, Robert Adlard, Zilong Tan, Mohamed Shariff, Disease and health management in Asian aquaculture, Veterinary Parasitology, Volume 132, Issues 3-4, From Science to Solutions - Plenary Lectures Presented at the 20th Conference of the World Association for the Advancement of Veterinary Parasitology, 30 September 2005, Pages 249-272, ISSN 0304-4017, DOI: 10.1016/j.vetpar.2005.07.005.
(http://www.sciencedirect.com/science/article/B6TD7-4GWBF5X-1/2/155e7d9928dcff388f567ad702b469ac)
Abstract:
Asia contributes more than 90% to the world's aquaculture production. Like other farming systems, aquaculture is plagued with disease problems resulting from its intensification and commercialization. This paper describes the various factors, providing specific examples, which have contributed to the current disease problems faced by what is now the fastest growing food-producing sector globally. These include increased globalization of trade and markets; the intensification of fish-farming practices through the movement of broodstock, postlarvae, fry and fingerlings; the introduction of new species for aquaculture development; the expansion of the ornamental fish trade; the enhancement of marine and coastal areas through the stocking of aquatic animals raised in hatcheries; the unanticipated interactions between cultured and wild populations of aquatic animals; poor or lack of effective biosecurity measures; slow awareness on emerging diseases; the misunderstanding and misuse of specific pathogen free (SPF) stocks; climate change; other human-mediated movements of aquaculture commodities. Data on the socio-economic impacts of aquatic animal diseases are also presented, including estimates of losses in production, direct and indirect income and employment, market access or share of investment, and consumer confidence; food availability; industry failures. Examples of costs of investment in aquatic animal health-related activities, including national strategies, research, surveillance, control and other health management programmes are also provided. Finally, the strategies currently being implemented in the Asian region to deal with transboundary diseases affecting the aquaculture sector are highlighted. These include compliance with international codes, and development and implementation of regional guidelines and national aquatic animal health strategies; new diagnostic and therapeutic techniques and new information technology; new biosecurity measures including risk analysis, epidemiology, surveillance, reporting and planning for emergency response to epizootics; targeted research; institutional strengthening and manpower development (education, training and extension research and diagnostic services).
Keywords: Aquaculture; Parasite disease; Production loss; Disease management

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

Bart Roodenburg, Johan Morren, H.E. (Iekje) Berg, Sjoerd W.H. de Haan, Metal release in a stainless steel pulsed electric field (PEF) system: Part II. The treatment of orange juice; related to legislation and treatment chamber lifetime, Innovative Food Science & Emerging Technologies, Volume 6, Issue 3, September 2005, Pages 337-345, ISSN 1466-8564, DOI: 10.1016/j.ifset.2005.04.004.
(http://www.sciencedirect.com/science/article/B6W6D-4GCX1JC-1/2/f8445d30aefdf3da8a1db54f72b851fe)
Abstract:
In the last decennia, there is an increasing interest in pulsed electric field (PEF) treatment. The product is often treated in a continuous flow treatment chamber with stainless steel electrodes and exposed to short pulsed electric fields, typically 2-4 kV[middle dot]mm- 1 during 1-10 [mu]s. Due to direct contact of the treatment chamber electrodes with the food product, the main elements of these stainless steel electrodes are able to dissolve in the treated product. The magnitude of the material transfer depends on many factors such as current magnitude, pulse duration, pulse shape, and product constitution. In this contribution, the effect of metal dissolving during a monopolar pulse shape, generated by a pulse forming network, is investigated. Experiments are carried out with single and repeated PEF treatments in orange juice. These experiments showed that, due to PEF treatment, dissolved metals are present in the juice. The four main elements of stainless steel, iron, chromium, nickel, and manganese, have been considered in particular. The metal concentrations found do not exceed the legislation values for fruit juices and the EU Drinking Water Directive [EU Drinking Water Directive, http://www.europe.eu.int/.] for human consumption. From the experiments, a relationship between dissolved metals in orange juice and the transferred charge is derived. In addition, a lifetime prediction of the treatment chamber caused by release of metals has been made.Industrial relevance

This paper investigated the metal release in a stainless steel pulsed electric field (PEF) system by considering the effect on a real food product, in this case orange juice. This issue and the description about pulse shapes in Part I are of great importance for the commercialisation of the PEF technology. A relationship is determined between the dissolved metals in orange juice and the transferred charge. This parameter can be used during the development of larger PEF treatment systems for orange juice. For the described treatment system, a treatment chamber lifetime prediction is given that is based on the released metal concentrations. The metal concentrations are also compared to the Dutch and European legislation rules.
Keywords: PEF; Orange juice; Metal release; Legislation; Treatment chamber lifetime

G.H. Loneragan, M.M. Brashears, Pre-harvest interventions to reduce carriage of E. coli O157 by harvest-ready feedlot cattle, Meat Science, Volume 71, Issue 1, 51st International Congress of Meat Science and Technology (ICoMST), September 2005, Pages 72-78, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.04.005.
(http://www.sciencedirect.com/science/article/B6T9G-4GH4B1P-2/2/5d94e861db448859e442a4631b79a797)
Abstract:
Escherichia coli O157 is an important cause of food-borne illness. The primary reservoir for this organism is cattle and at present the major site of control is within abattoirs. Recent data have highlighted the importance of the pathogen load entering abattoirs on harvest-ready feedlot cattle. The likelihood for in-plant intervention failure increases as the proportion of cattle carrying E. coli O157 within a pen increases. Pre-harvest reduction of E. coli O157 colonization will require targeted intervention strategies and should reduce contamination of carcasses thereby enhancing public health. Several pre-harvest interventions show substantial promise, such as specific strains of direct-fed microbials, vaccine technology, sodium chlorate, and neomycin sulfate, whereas others such as Brown Seaweed or chlorination of water have little or no detectable benefit. Selection of validated interventions strategies will be important as efforts to control pre-harvest carriage of E. coli O157 increase.
Keywords: Food safety; E. coli O157; Interventions; Feedlot; Cattle

S.J. Eilert, New packaging technologies for the 21st century, Meat Science, Volume 71, Issue 1, 51st International Congress of Meat Science and Technology (ICoMST), September 2005, Pages 122-127, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.04.003.
(http://www.sciencedirect.com/science/article/B6T9G-4GG2JPD-1/2/3c2a906bc321929f7b89db879d454686)
Abstract:
This paper reviews the major influencers that will drive change in meat packaging. A review of the current state of fresh-meat packaging in the US has shown a continued evolution to case ready packaging, with 60% of the packages audited being in the case ready format, versus 49% just two years earlier. Additionally, the market is moving to a higher degree of convenience in the meat case, and reducing the linear feet devoted to fresh meat (69% fresh meat linear feet two years ago, versus 63% in 2004). Additional evidence for the growth of convenience items was shown by a 48% growth in shelf stable meal kits between 1998 and 2003. Packaging innovations have been developed to meet these needs for convenience, but have largely been implemented outside of the meat industry. These include, but are not limited to, lines of hand-held soups, self-heating cans and cartons that are replacing the traditional steel can for retort purposes. The recent developments of films that are ovenable in traditional as well as microwave ovens are critical to the further advancement of convenience meat items. Material costs are also driving the need for packaging innovations. Polyethylene costs rose 20% during the second half of 2003, which is largely due to increased petroleum costs. As petroleum costs are sustained at the current high levels, renewable packaging for food, such as materials based on polylactide, will become more

feasible. Labor costs and availability at retail will continue to drive the demand for case ready packaging innovations. The recent regulatory approval of carbon monoxide in fresh meat packaging in the US will enable greater usage of low oxygen packaging formats and should provide greater retail acceptance of case ready in the US.
Keywords: Meat packaging; Modified atmosphere packaging; Consumers; Technology; Economic

Emoke Bendixen, The use of proteomics in meat science, Meat Science, Volume 71, Issue 1, 51st International Congress of Meat Science and Technology (ICoMST), September 2005, Pages 138-149, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.03.013.
(http://www.sciencedirect.com/science/article/B6T9G-4G4N0GS-2/2/e416734a5b0534f860e0ea6ec2b917a5)
Abstract:
Characterising the function of genes is a major challenge in the post-genomic era. Post-genomic tools and technologies have dramatically changed the experimental approaches by which complex biological systems can be characterised.
Proteomics is an important cornerstone in functional genome characterisation, and like all other functional genomics tools, including transcriptomics and metabolomics, the aim of proteome studies is to translate genome information into useful biological insight, that will allow scientists to build and test better hypotheses, with the ultimate goal to find better solutions to challenges in food production, medicine and environmental management.
In agricultural sciences as well as in all other life sciences, the implementation of proteomics and the other post-genomic tools is an important step towards achieving better product quality and a more sustainable animal production.
The aim of this review is to introduce the developing field of proteomics, and to discuss the use of proteomics in meat science projects. The most frequently used technologies for characterising cellular protein expression patterns will be introduced, and some early examples of applying proteomics to meat quality research will be discussed.
Keywords: Proteomics; Review; Meat; Quality; Mass spectrometry; Systems biology

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

K.C. Das, In: A. Pandey, Editor, Concise Encyclopedia of Bioresource Technology, Food Products Press, Binghamton, NY, USA (2004) ISBN 1-56022-980-2, p. 735 Price US$149.95 (hardback).,

Agricultural Systems, Volume 85, Issue 2, August 2005, Pages 206-207, ISSN 0308-521X, DOI: 10.1016/j.agsy.2005.01.007.
(http://www.sciencedirect.com/science/article/B6T3W-4FJD9FG-3/2/51d717ae377950c17a22cbceefb351a4)

Amol Goel, Christopher W. Zobel, Eluned C. Jones, A multi-agent system for supporting the electronic contracting of food grains, Computers and Electronics in Agriculture, Volume 48, Issue 2, August 2005, Pages 123-137, ISSN 0168-1699, DOI: 10.1016/j.compag.2005.02.016.
(http://www.sciencedirect.com/science/article/B6T5M-4G9Y450-1/2/141cf7f0620dea6d91b34f192accef5e)
Abstract:
With increasing competition and better transportation facilities, the relationships between supply chain actors are getting more complex and individual profit margins are shrinking. Decisions at different levels of the supply chain can no longer be considered independent, since they may influence profitability across the supply chain. Information technology based solution frameworks offer a way to more effectively integrate decision-making by enabling better knowledge sharing and facilitating more transparent economic transactions. This paper proposes the use of a multi-agent system to represent and integrate the decision-making processes of various actors within the food grain supply chain. Within the context of such a system, it presents an internet-based combinatorial auction framework as a technique for implementing electronic contracting (e-contracting) of food grains. The discussion focuses on the relationship between producers and millers, and presents preliminary simulation results that demonstrate the applicability and effectiveness of software agents within the proposed auction environment.
Keywords: Intelligent agents; Combinatorial auction; Supply chain; E-commerce

John G. Knight, Damien W. Mather, David K. Holdsworth, Impact of genetic modification on country image of imported food products in European markets: Perceptions of channel members, Food Policy, Volume 30, Issue 4, August 2005, Pages 385-398, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2005.05.001.
(http://www.sciencedirect.com/science/article/B6VCB-4GHRC92-2/2/361b7b58b23988a022bceeb833a1d39f)
Abstract:
Risk to the image of food exporting countries in foreign markets for food products has been advanced as a reason for them to ban commercial release of genetically modified (GM) crops. The aim of this paper is to explore the reality and intensity of such a risk. In-depth interviews have been conducted with key distributors in the European food sector to ascertain factors that they consider important in determining reputation of exporting countries, and to ascertain whether GM impacts on such reputations. Highly negative consumer sentiment towards GM in Europe seems likely to continue to influence food industry buyers against importing GM food. However, no evidence was found that presence of GM crops in a country causes negative perception of non-GM food imported from that country. Provided adequate steps are taken to avoid accidental contamination of conventional crops, producer countries do not appear at great risk of damaging their overall country image for food products if GM technology is introduced.
Keywords: Genetic modification; Gatekeeper; Country image; GM crops

Jorgen J. Leisner, Weeds, heat and pure cultures - On the differential success of new technologies in the Danish and American creamery industries in the 1890s, Food Policy, Volume 30, Issue 4, August 2005, Pages 419-433, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2005.03.002.
(http://www.sciencedirect.com/science/article/B6VCB-4GHRC92-1/2/2eb9c1d5211f5637d164c38b9f3cceb4)
Abstract:

Danish creameries introduced with government support pasteurization of cream during the 1890s which necessitated use of starter cultures to replace the heat-killed indigenous cream micro-flora. The Danish creameries exported the majority of their butter to the UK market that preferred a rather bland flavor. The US creameries did not implement pasteurization of cream successfully at that time. The primary reason for this outcome was that butter made from pasteurized cream lacked flavor components preferred by the American market. The US creameries experimented, however, with starter cultures to improve butter flavor, though without adopting the current best practice as they used unpasteurized cream. This study shows that differences in consumer preferences for butter flavor had a deciding impact on the introduction of new technologies to the creamery industry. This result anticipate current debates on introduction and diffusion of new technologies in the food industry.
Keywords: Technology; Diffusion; Cream; Denmark; US

R.F. Follett, S.R. Shafer, M.D. Jawson, A.J. Franzluebbers, Research and implementation needs to mitigate greenhouse gas emissions from agriculture in the USA, Soil and Tillage Research, Volume 83, Issue 1, Greenhouse Gas Contributions and Mitigation Potential in Agricultural Regions of North America, August 2005, Pages 159-166, ISSN 0167-1987, DOI: 10.1016/j.still.2005.02.014.
(http://www.sciencedirect.com/science/article/B6TC6-4FP1J80-1/2/a8eb239f7224be1dff01ad52adcd8ecc)
Abstract:
An urgent need exists to understand which agricultural land uses and land resource types have the greatest potential to mitigate greenhouse gas (GHG) emissions contributing to global change. Global change is a natural resource issue increasingly contributed to by human activities that now joins other important issues facing agricultural scientists, such as depletion of soil organic carbon (SOC), soil degradation and contamination, and pollution of natural waters by soil sediments and nutrients. Increasing demand for food by the growing global population is resulting in increased GHG emissions, soil disturbance, fossil fuel consumption to produce agricultural products, and biomass burning. To address these issues and the threat of accelerated GHG emissions, this paper addresses: (1) current scientific facts about the attributes of soil and natural resources, (2) strategies for sustainable use of our finite, non-renewable, and fragile land resources, and (3) advances made by agricultural sciences and their potential role in forming policy.
Site-specific adaptation of appropriate conservation technologies will be needed for sequestering SOC and reducing nitrous oxide (N2O) emission. Adoption of improved conservation technologies to mitigate GHG emission should consider: (i) the rate of C sequestration or GHG mitigation, (ii) the price offered for adopting various practices, (iii) the ease with which producers and land managers can alter land use and management activities, (iv) the potential impacts of targeting regions or practices, (v) the ancillary benefits to soil, water and air quality upon adoption of practices to sequester SOC or mitigate GHG emission, and (vi) the effectiveness and efficiency of various policies.
Development of improved conservation technologies to reduce GHG emissions could become part of more comprehensive conservation programs aimed at environmental protection, food security, and agricultural sustainability. An overarching research need is to determine the multiple benefits and trade-offs of improved conservation technologies so that land managers can systematically meet production and environmental goals and so that the most effective policies can be devised.
Keywords: Soil organic C; Nitrous oxide; Greenhouse gas mitigation; Agricultural management

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

Anil K. Deisingh, Neela Badrie, Detection approaches for genetically modified organisms in foods, Food Research International, Volume 38, Issue 6, July 2005, Pages 639-649, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.01.003.
(http://www.sciencedirect.com/science/article/B6T6V-4FJTNY7-1/2/4f72b044c63eff8ccde1fabb254aaefe)
Abstract:
This review examines the various detection strategies for genetically modified organisms (GMOs) in food products. It begins with a brief discussion of the issues related to the technology especially the risks and public concerns. An introduction to the biological aspects of the major GMOs then follows. The bulk of the review is concerned with the different approaches toward detection: (a) PCR-based methods such as real-time, duplex and multiplex, (b) the use of biosensors and microarrays, (c) the presence of commercially available kits, and (d) other methods such as electrophoresis and wavelength-dispersive X-ray fluorescence. Each of these methods is critically discussed and various applications are described.
Keywords: Polymerase chain reaction; Biosensors; Kits; Genetically modified organisms; Microarrays

A.M. Trater, S. Alavi, S.S.H. Rizvi, Use of non-invasive X-ray microtomography for characterizing microstructure of extruded biopolymer foams, Food Research International, Volume 38, Issue 6, July 2005, Pages 709-719, ISSN 0963-9969, DOI: 10.1016/j.foodres.2005.01.006.
(http://www.sciencedirect.com/science/article/B6T6V-4FXNRDR-1/2/43d24991b30ecc0483daa3f090dbbd01)
Abstract:
Understanding foam microstructure formation is important for a priori design and engineering of new biopolymer-based products for both food and industrial applications. However, this has been hindered by unavailability of an imaging technology to characterize the cellular structure of foams accurately. This study investigated a non-invasive imaging technology, X-ray microtomography (XMT), for visualization and measurement of microstructural features of biopolymer foams. Brittle corn starch foams with two levels (5% and 15%) of whey protein concentrate (34% protein) factorialized with two moisture contents (26% or 34%) were produced using extrusion. XMT allowed non-invasive imaging of sample cross-sections at various depths, and facilitated accurate and hitherto impossible measurements of features like true cell size distribution (bi-modal),

average diameter (0.58 to 2.27 mm), open wall area fraction (0.068 to 0.099), cell wall thickness (0.09 to 0.15 mm), and true void fraction (0.63 to 0.84). Results indicated XMT is superior to conventional imaging techniques for characterizing foam microstructure.
Keywords: X-Ray; Microtomography; Microstructure; Biopolymer; Foams; Imaging; Extrusion

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

Katrin Ernst, Birger Puppe, Peter C. Schon, Gerhard Manteuffel, A complex automatic feeding system for pigs aimed to induce successful behavioural coping by cognitive adaptation, Applied Animal Behaviour Science, Volume 91, Issues 3-4, June 2005, Pages 205-218, ISSN 0168-1591, DOI: 10.1016/j.applanim.2004.10.010.
(http://www.sciencedirect.com/science/article/B6T48-4F3P7K5-1/2/d470886b5e197d2a34ade45681439f8c)
Abstract:
In modern intensive husbandry systems there is an increasing tendency for animals to interact with technical equipment. If the animal-technology interface is well-designed this may improve animal welfare by offering challenges for cognitive adaptation. Here a system and its application is presented that acoustically calls individual pigs out of a group (n = 8) to a feeding station. In three different learning phases, the computer-controlled 'call-feeding-station' (CFS) trained the animals to recognize a specific acoustic signal as a summons for food, using a combination of classical and operant conditioning techniques. The experimental group's stall contained four CFSs, at each of which one animal at a time was able to feed. When an animal had learned to discriminate and recognize its individual acoustic signal it had to localize the particular CFS that was calling and to enter inside it. Then, it received a portion of feed, the amount of which was adapted to the respective age of the animals. Each animal was called at several, unpredictable times each day and the computer programme ensured that the total feed supply was sufficient for each animal. In the last phase of the experiment the animals, in addition, had to press a button with an increasing fixed ratio for the delivery of feed. It was demonstrated that the pigs were able to adapt quickly to

the CFSs. Although they were challenged over 12 h daily by requirements of attention, sensory localization and motor efforts to gain comparatively low amounts of feed, they performed well and reached fairly constant success rates between 90 and 95% and short delays between 14 and 16 s between a summons and the food release in the last phase of the experiment. The weight gain during the experiment was the same as in a conventionally fed control group (n = 8). We therefore conclude that CFSs present a positive challenge to the animals with no negative effects on performance but with a potentially beneficial role for welfare and against boredom. The system is also a suitable experimental platform for research on the effects of successful adaptation by rewarded cognitive processes in pigs.
Keywords: Learning; Cognition; Reward; Welfare; Pig

Geertrui Van Overwalle, Protecting and sharing biodiversity and traditional knowledge: Holder and user tools, Ecological Economics, Volume 53, Issue 4, Biodiversity Conservation, Access and Benefit Sharing and Traditional Knowledge, 1 June 2005, Pages 585-607, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2004.10.014.
(http://www.sciencedirect.com/science/article/B6VDY-4G4XBXM-1/2/149edd0e640e5a1f732fc3fb9ddb2cc9)
Abstract:
The present paper deals with the question how legal protection of biodiversity and traditional knowledge can be accommodated and how the results from the use and exploitation of biodiversity and traditional knowledge can be shared. The aim is to cast the various contributions in this volume in a wider framework, by describing and evaluating current intellectual property (IP) protection systems, intellectual property-similar regimes and protection and sharing initiatives outside intellectual property.
Keywords: Biodiversity; Traditional knowledge; Intellectual property rights; Patents; Plant breeder's rights; Farmer's rights; GURTs; ABS regimes; Sui generis regimes; Fair and equitable sharing

C. Cortes, M.J. Esteve, A. Fri'gola, F. Torregrosa, Quality characteristics of horchata (a Spanish vegetable beverage) treated with pulsed electric fields during shelf-life, Food Chemistry, Volume 91, Issue 2, June 2005, Pages 319-325, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.06.014.
(http://www.sciencedirect.com/science/article/B6T6R-4CYWMJ1-8/2/5bbfa7f30fd56574c47d06c928ff2ca3)
Abstract:
The application of pulsed electric fields (PEF) is one of the new non-thermal technologies being studied to evaluate their potential as alternative or complementary processes to thermal pasteurization. 'Horchata de chufa' (tiger nut milk or earth almond milk) is of high nutritional quality and therefore has great potential in the food market, limited by its very short shelf-life. The present work studies whether PEF can be used to obtain a quality horchata and increase its shelf-life while maintaining its organoleptic characteristics. In order to do so we determined pH, total fat, peroxide index, thiobarbituric acid-reactive substances index, formol index, and peroxidase activity in natural (untreated) horchata and horchata subjected to various PEF treatments and studied their stability during refrigerated storage (2-4 [degree sign]C). After PEF treatment, only peroxidase activity decreased significantly ($p < 0.05$). This parameter and pH varied during the shelf-life of the horchata, and a negative correlation was obtained between pH and peroxidase activity.
Keywords: Quality; Horchata; Pulsed electric fields

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.

F. Ewert, M.D.A. Rounsevell, I. Reginster, M.J. Metzger, R. Leemans, Future scenarios of European agricultural land use: I. Estimating changes in crop productivity, Agriculture, Ecosystems & Environment, Volume 107, Issues 2-3, 20 May 2005, Pages 101-116, ISSN 0167-8809, DOI: 10.1016/j.agee.2004.12.003.
(http://www.sciencedirect.com/science/article/B6T3Y-4F7Y96F-2/2/bf6906fc277a043ec99e202194e75add)
Abstract:
The future of agricultural land use in Europe is unknown but is likely to be influenced by the productivity of crops. Changes in crop productivity are difficult to predict but can be explored by scenarios that represent alternative economic and environmental pathways of future development. We developed a simple static approach to estimate future changes in the productivity of food crops in Europe (EU15 member countries, Norway and Switzerland) as part of a larger approach of land use change assessment for four scenarios of the IPCC Special Report on Emission Scenarios (SRES) representing alternative future developments of the world that may be global or regional, economic or environmental. Estimations were performed for wheat (Triticum aestivum) as a reference crop for the time period from 2000 until 2080 with particular emphasis on the time slices 2020, 2050 and 2080. Productivity changes were modelled depending on changes in climatic conditions, atmospheric CO2 concentration and technology development. Regional yield statistics were related to an environmental stratification (EnS) with 84 environmental strata for Europe to estimate productivity changes depending on climate change as projected by the global climate model HadCM3. A simple empirical relationship was used to estimate crop productivity as affected by increasing CO2 concentration simulated by the global environment model IMAGE 2.2. Technology was modelled to affect potential yield and the gap between actual and potential yield. We estimated increases in crop productivity that ranged between 25 and 163% depending on the time slice and scenario compared to the baseline year (2000). The increases were the smallest for the regional environmental scenario and the largest for the global economic scenario. Technology development was identified as the most important driver but relationships that determine technology development remain unclear and deserve further attention. Estimated productivity changes beyond 2020 were consistent with changes in the world-wide demand for food crops projected by IMAGE. However, estimated increases in productivity exceeded expected demand changes in Europe for most scenarios, which is consistent with the observed present oversupply in Europe. The developed scenarios enable exploration of future land use changes within the IPCC SRES scenario framework.
Keywords: Crop productivity; Modelling; Technology development; Climate change; Increasing CO2; Land use change

M.D.A. Rounsevell, F. Ewert, I. Reginster, R. Leemans, T.R. Carter, Future scenarios of European agricultural land use: II. Projecting changes in cropland and grassland, Agriculture, Ecosystems &

Environment, Volume 107, Issues 2-3, 20 May 2005, Pages 117-135, ISSN 0167-8809, DOI: 10.1016/j.agee.2004.12.002.
(http://www.sciencedirect.com/science/article/B6T3Y-4F7Y96F-1/2/7c9738e98a8dd4541d5273909985f9e5)
Abstract:
This paper presents the development of quantitative, spatially explicit and alternative scenarios of future agricultural land use in Europe (the 15 European Union member states, Norway and Switzerland). The scenarios were constructed to support analyses of the vulnerability of ecosystem services, but the approach also provides an exploration of how agricultural land use might respond to a range of future environmental change drivers, including climate and socio-economic change. The baseline year was 2000 and the scenarios were constructed for 3 years (2020, 2050 and 2080) at a spatial resolution of 10 min latitude and longitude. Time slices were defined for the climate scenarios as the 10 years before 2020, 2050 and 2080. The scenarios were based on an interpretation of the four storylines of the Special Report on Emission Scenarios (SRES) of the Intergovernmental Panel on Climate Change (IPCC) using a simple supply/demand model of agricultural area quantities at the European scale and the disaggregation of these quantities using scenario-specific, spatial allocation rules. The scenarios demonstrate the importance of assumptions about technological development for future agricultural land use in Europe. If technology continues to progress at current rates then the area of agricultural land would need to decline substantially. Such declines will not occur if there is a correspondingly large increase in the demand for agricultural goods, or if political decisions are taken either to reduce crop productivity through policies that encourage extensification or to accept widespread overproduction. For the set of parameters assumed here, cropland and grassland areas (for the production of food and fibre) decline by as much as 50% of current areas for some scenarios. Such declines in production areas would result in large parts of Europe becoming surplus to the requirement of food and fibre production. Although it is difficult to anticipate how this land would be used in the future, it seems that continued urban expansion, recreational areas (such as for horse riding) and forest land use would all be likely to take up at least some of the surplus. Furthermore, whilst the substitution of food production by energy production was considered in these scenarios, surplus land would provide further opportunities for the cultivation of bioenergy crops.
Keywords: Land use scenarios; Special Report on Emission Scenarios (SRES); Climate change

E. Vivekanandan, M. Srinath, Somy Kuriakose, Fishing the marine food web along the Indian coast, Fisheries Research, Volume 72, Issues 2-3, May 2005, Pages 241-252, ISSN 0165-7836, DOI: 10.1016/j.fishres.2004.10.009.
(http://www.sciencedirect.com/science/article/B6T6N-4F00XXP-1/2/f99afb899e32f66db3a4d8c55341a37a)
Abstract:
The annual mean trophic level (TrL) of marine fish landings along the Indian coast consisting of 53 exploited species/groups was estimated for the period 1950-2002. The landings as well as TrL increased along the northwest (NW) and southwest (SW) coasts. However, increase in the landings was associated with decrease in mean TrL along the east coast, particularly along the southeast (SE) coast at the rate of 0.04 per decade. The increasing trend of the FIB index ceased in the last 5-10 years along three coasts. A backward-bending signature in the landings versus TrL plot for the SE coast in the last 6 years indicates fisheries-induced changes in the ecosystem owing to low productivity of the coastal waters and high density of fishing craft. The landings of most of the large predators increased along the Indian coast, but higher removals appear to have helped proliferation of their prey, the mid-level carnivores. Fishing the food web has been influenced by environmental fluctuations, advanced fishing technologies, and market-driven, deliberate fishing on low-trophic level (TL) invertebrates such as the penaeid prawns.
Keywords: Landings; Trophic level; FIB index; Fishing the food web; Indian coast

Brian A. Federici, Insecticidal bacteria: An overwhelming success for invertebrate pathology, Journal of Invertebrate Pathology, Volume 89, Issue 1, Special SIP Symposium Issue, May 2005, Pages 30-38, ISSN 0022-2011, DOI: 10.1016/j.jip.2005.06.007.
(http://www.sciencedirect.com/science/article/B6WJV-4H39JHW-7/2/15cc05978888f481a9e145fefc2a8327)
Abstract:
The discovery and study of insecticidal bacteria, which began a little over a century ago, led to the development of commercial bacterial insecticides in the middle of the century that became the first successful and widely used microbial control agents. Most of these products were based on Bacillus thuringiensis, a bacterium that kills insects through the use of insecticidal proteins that subsequently became known as Cry proteins. While most of these products were only effective against lepidopteran pests, their success eventually led in the 1970s and 1980s to the discovery of strains effective against larvae of coleopteran pests and nematocerous dipterans, such as vector and nuisance mosquitoes and blackflies. The cloning in 1981 of the first gene encoding a Cry protein led to an explosion of basic and applied research that culminated in new strains of recombinant insecticidal bacteria and, even more importantly, the development, commercialization, and wide-scale deployment of insecticidal transgenic crops based on Cry proteins. This new and environmentally safe technology has revolutionized agricultural pest control, yielding a multibillion dollar industry that is paving the way to new types of plants that will dominate food and fiber production as the 21st century progresses. In this brief symposium paper, I provide an overview of some of the key work that led to this remarkable success.
Keywords: Insecticidal bacteria; Transgenic crops; Bacillus thuringiensis; Bacillus popilliae; Cry proteins; Cyt proteins; Insect pest control; Vector control

Dag Standal, Nuts and bolts in fisheries management--a technological approach to sustainable fisheries?, Marine Policy, Volume 29, Issue 3, May 2005, Pages 255-263, ISSN 0308-597X, DOI: 10.1016/j.marpol.2004.04.004.
(http://www.sciencedirect.com/science/article/B6VCD-4CS4MN5-3/2/0fce61a5669a5156a73e8f159b983c74)
Abstract:
According to the Food and Agriculture Organization of the United Nations, overcapacity in the fishing fleet poses a fundamental challenge in fisheries. Overcapacity leads to an increased pressure on fish stocks and a decrease in economic profit. The fishing fleet is marginalised economically, and overcapacity creates allocation conflicts between different gear and vessel groups. In addition, the expenses to control and management increase. Although Norwegian authorities have introduced several restrictions, for example total allowable catch, licenses, vessel quotas, and other regulatory measures, this article shows that the problems connected to overcapacity persist. Analyses of the technical capacity development show that there is an overall capacity expansion although the number of vessels is reduced. This development is an indicator of the dynamics of technological development over time, and the article discusses whether the concept of technology is sufficiently integrated into fisheries management. The important question now is whether analyses of the technical capacity development can serve as a positive supplement to the traditional fisheries management, which largely is based on input from the scientific disciplines biology and economics.
Keywords: Capacity expansion; Technology; Sustainable management

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.

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

Bo Jiang, Yoshinori Mine, Fifth International Conference on Food Science and Technology, Food Research International, Volume 38, Issue 3, Food of the 21st Century: Safety & Health, April 2005, Page 241, ISSN 0963-9969, DOI: 10.1016/j.foodres.2004.11.003.
(http://www.sciencedirect.com/science/article/B6T6V-4F29HT4-1/2/43314bc0b1d512036b2e11a583be88fb)

Ramadan Atra, Gyula Vatai, Erika Bekassy-Molnar, Agnes Balint, Investigation of ultra- and nanofiltration for utilization of whey protein and lactose, Journal of Food Engineering, Volume 67, Issue 3, April 2005, Pages 325-332, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.04.035.
(http://www.sciencedirect.com/science/article/B6T8J-4CSYN3M-1/2/e23a3491f96577627eaef5dcdec4194c)
Abstract:
Ultrafiltration is one of the most fascinating technologies, which has been introduced for application in the dairy industry. Ultrafiltration makes it possible to improve the quality of traditional dairy products, to create new food staffs, to utilize dairy by-products (such as whey) to a much greater extent for human nutrition and to prepare milk ingredients to be used in the entire food industry.
In this study the application of ultrafiltration for milk and whey protein concentration, and research on nanofiltration for lactose concentration of the ultrafiltration permeate are detailed.
The performance of ultra- and nanofiltration membranes can be characterized in terms of permeate flux, membrane retention and yield, which parameters are determined by pressure, recycle flow rate and temperature. The influence of these parameters on milk- and whey protein and lactose concentration was measured. The experiments were carried out using laboratory scale ultra- and nanofiltration units. The permeate flux, protein and lactose content in the permeate and in the concentrate fractions were measured during the experimental runs. Comparing the separation behavior of the membranes it was found that the investigated membranes are suitable for concentration of the milk- and whey proteins and lactose with high flux and retention. The filtration characteristics were obviously influenced by the process parameters.
A new combination of membrane based cheese production procedure is proposed, which makes possible a significant increase in the cheese yield by incorporating the whey proteins.
Keywords: Concentration of milk and whey; Ultrafiltration; Nanofiltration

D.L. Corwin, R.E. Plant, Applications of apparent soil electrical conductivity in precision agriculture, Computers and Electronics in Agriculture, Volume 46, Issues 1-3, Applications of Apparent Soil Electrical Conductivity in Precision Agriculture, March 2005, Pages 1-10, ISSN 0168-1699, DOI: 10.1016/j.compag.2004.10.004.
(http://www.sciencedirect.com/science/article/B6T5M-4F37M4C-1/2/f8460da5d94b7cd1130ad0adfce8e443)
Abstract:
Sustainable agriculture is considered the most viable means of meeting future food needs for the world's increasing population through its goal of delicately balancing crop productivity, profitability, natural resource utilization, sustainability of the soil-plant-water environment and environmental impacts. Precision agriculture is a proposed approach for achieving sustainable agriculture. Site-specific crop management (or site-specific management, SSM) refers to the application of precision agriculture to crop production. Site-specific crop management utilizes rapidly evolving information and electronic technologies to modify the management of soils, pests and crops in a

site-specific manner as conditions within a field change spatially and temporarily. Geospatial measurements of apparent soil electrical conductivity (ECa) are the most reliable and frequently used measurements to characterize within-field variability of edaphic properties for application to SSM. The collection of papers that comprises this special issue of Computers and Electronics in Agriculture provides a review of the current technology and understanding of geospatial measurements of ECa and current approaches for their application in SSM. The objective of this preface is to run a thread through the papers to show their interrelationship and to identify significant points. The spectrum of topics covered by the papers include: (i) a review of the use of ECa measurements in agriculture, (ii) multi-dimensional ECa modeling and inversion, (iii) theory and principles elucidating the edaphic properties that influence the ECa measurement, (iv) ECa survey protocols for characterizing spatial variability, (v) ECa-directed response surface sampling design, (vi) designing and evaluating field-scale experiments using geospatial ECa measurements, (vii) mapping of soil properties with ECa, (viii) spatially characterizing ECa and water content with time domain reflectometry (TDR), (ix) delineating productivity and SSM zones and (x) SSM methods for reclaiming salt-affected soils. The greatest potential for the application of geospatial measurements of ECa in SSM is to provide reliable spatial information for directing soil sampling to identify and characterize the spatial variability of edaphic properties influencing crop yield. This in turn can be used to delineate SSM units, which are key components of SSM. The future of SSM depends upon the continued development and integration of information and electronic technologies that can identify and characterize, both temporally and spatially, not only edaphic properties but also topographical, biological, meteorological and anthropogenic factors influencing within-field variations in crop productivity. The implementation of global positioning system (GPS)-controlled variable-rate equipment will need spatial information to effectively determine input application rates. Because of their reliability, ease of measurement and flexibility, geospatial ECa data will undoubtedly contribute a significant portion of the spatial soils-related information needed to direct variable-rate equipment.
Keywords: ECa; Site-specific management units; Spatial variability; Soil quality

Ricardo Godoy, Victoria Reyes-Garcia, Vincent Vadez, William R. Leonard, Tomas Huanca, Jonathan Bauchet, Human capital, wealth, and nutrition in the Bolivian Amazon, Economics & Human Biology, Volume 3, Issue 1, March 2005, Pages 139-162, ISSN 1570-677X, DOI: 10.1016/j.ehb.2005.01.001.
(http://www.sciencedirect.com/science/article/B73DX-4FCRFG9-1/2/a23536a92a070d96d1d6d1ae678cdb5f)
Abstract:
We analyze anthropometric variables of a society of forager-horticulturalists in the Bolivian Amazon (Tsimane') in 2001-2002. Community variables (e.g., inequality, social capital) explain little of the variance in anthropometric indices of nutritional status, but individual-level variables (schooling, wealth) are positively correlated with nutritional status. Dietary quality (foods high in animal proteins), access to foraging technology, and traditional knowledge of medicinal plants are related to better anthropometric indices.
Keywords: Anthropometrics; Wealth; Human capital; Nutritional status; Tsimane'; Income inequality; Bolivia; Amazon; Indigenous populations; Height; Physical stature; Amerindians; Latin America

Tomoko Aoki, Eric A. Decker, D. Julian McClements, Influence of environmental stresses on stability of O/W emulsions containing droplets stabilized by multilayered membranes produced by a layer-by-layer electrostatic deposition technique, Food Hydrocolloids, Volume 19, Issue 2, March 2005, Pages 209-220, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2004.05.006.
(http://www.sciencedirect.com/science/article/B6VP9-4CS4VPF-1/2/51e8b8cf90142c1c52e58a92db858305)

Abstract:
A three step process, based on electrostatic layer-by-layer deposition, was used to produce oil-in-water emulsions containing submicron (d32[approximate]0.3 [mu]m) oil droplets stabilized by sodium dodecyl sulfate (SDS)-chitosan-pectin membranes (100 mM acetic acid, pH 3.0). First, primary emulsions (5 wt% corn oil, 5 mM SDS) containing anionic droplets ([zeta][approximate]-60 mV) stabilized by SDS membranes were prepared using a high-pressure value homogenizer. Second, secondary emulsions (1 wt% corn oil, 1 mM SDS, 0.024 wt% chitosan) containing cationic droplets ([zeta][approximate]+59 mV) stabilized by SDS-chitosan membranes were formed by diluting the primary emulsion with aqueous chitosan solution and agitating to disrupt any flocs. Third, tertiary emulsions (0.2 wt% corn oil, 0.2 mM SDS, 0.0048 wt% chitosan, 0.040 wt% pectin) containing anionic droplets ([zeta][approximate]-14 mV) stabilized by SDS-chitosan-pectin membranes were formed by diluting the secondary emulsion with aqueous pectin solution. The stability of primary, secondary and tertiary emulsions to pH, ionic strength, thermal processing and freeze-thaw cycling were determined. The droplets in tertiary emulsions had good stability to droplet aggregation over a wide range of pH values (pH 3.0-8.0), NaCl concentrations (<=500 mM NaCl), thermal treatments (30-90 [degree sign]C for 20 min) and freeze-thaw cycling (-20 [degree sign]C for 22 h/30 [degree sign]C for 2 h). The interfacial engineering technology utilized in this study could lead to the creation of food emulsions with improved stability to environmental stresses.
Keywords: Emulsion stability; Layer-by-layer deposition; SDS; Chitosan; Pectin

A. Wiseman, P.S. Goldfarb, L.F.J. Woods, Can Greener Technology Sustain Downstream Processing in Novel Food Bioprocessing by Elimination of Reactive Oxygen Species?, Food and Bioproducts Processing, Volume 83, Issue 1, March 2005, Pages 68-69, ISSN 0960-3085, DOI: 10.1205/fbp.04058.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVNV-9/2/ba1aab41848cec67c01302990f68859b)
Abstract:
Early planning of problem circumvention in scale-up (or scale-down) by in silico and real-lab comparison exercises should supersede approaches to separation procedures intended to deliver green-technology outcomes. Downstream processing (DP) applied to cleaner technology should be afforded equal status with other essential stages in designer unit operation process components. This necessitates a `whole-process' reappraisal so that noxious side products are avoided in the process and in DP. Elimination of dangerous reactive oxygen species is essential for a greener DP outcome.
Keywords: green-technology; downstream processing; ROS; antioxidants; enzymes

Amparo Lopez-Rubio, Jose M. Lagaron, Pilar Hernandez-Munoz, Eva Almenar, Ramon Catala, Rafael Gavara, Melvin A. Pascall, Effect of high pressure treatments on the properties of EVOH-based food packaging materials, Innovative Food Science & Emerging Technologies, Volume 6, Issue 1, March 2005, Pages 51-58, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.09.002.
(http://www.sciencedirect.com/science/article/B6W6D-4F1GYRP-1/2/3f6c3b1c8421e4bcff0fa4d87f509e02)
Abstract:
The effects of different high pressure processing (HPP) treatments on EVOH-based packaging materials were studied and they were compared with the morphological effects produced by a more traditional food preservation technology, i.e. sterilization. The samples were high pressure processed at 400 and 800 MPa, during 5 and 10 min at two different temperatures, 40 and 75 [degree sign]C. Sterilization was carried out in an autoclave at 120 [degree sign]C during 20 min. Oxygen barrier and morphological properties of the treated packaging structures were analyzed and compared with those of the untreated samples. The results proved that HPP scarcely affects

packaging materials, especially when compared with the detrimental consequences of retorting.Industrial relevance
Although commercial food products are being high pressure processed packaged in flexible packaging materials relatively little information is available regarding the impact on high pressure. This paper addresses critical issues such as pressure effects on permeability and morphology of EVOH-based packaging structures which are essential to be able to assure food safety during pressure treatment and storage. A slight increase in crystalline morphology resulting in better barrier properties could be found after pressure treatment.
Keywords: High pressure processing; EVOH; Packaging materials; Oxygen permeability; Morphological properties

Mary Smiddy, Lisa O'Gorman, Roy D. Sleator, Joseph P. Kerry, Margaret F. Patterson, Alan L. Kelly, Colin Hill, Greater high-pressure resistance of bacteria in oysters than in buffer, Innovative Food Science & Emerging Technologies, Volume 6, Issue 1, March 2005, Pages 83-90, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.10.005.
(http://www.sciencedirect.com/science/article/B6W6D-4F1GYRP-2/2/2f383c40f65a043994133ca421f720d0)
Abstract:
High-pressure (HP) treatment is currently being investigated as a process for extending the shelf life of oysters through microbial inactivation. The aim of this study was to compare baroresistance in oysters and phosphate-buffered saline (PBS) of the Gram-negative bacteria, Vibrio mimicus 9583 and Escherichia coli O157:H45, and the Gram-positive bacteria, Listeria innocua MP2418 and Listeria monocytogenes LO28. A novel injection method was developed to allow reproducible, high numbers (106-108) of bacteria to be obtained in oysters. At a pressure >400 MPa, inactivation of all bacteria studied was considerably less in oysters than in PBS. This difference in the level of HP-induced inactivation of bacteria between oysters and PBS increased with treatment pressure, culminating in a 5-log difference at 480-600 MPa for all bacteria studied. E. coli and L. innocua were the most baroresistant of the species studied, with only a ~3-log inactivation of both bacteria observed in oysters after treatment at 700 MPa. The influence of salt content, one of the main differences between oysters and PBS, on baroresistance of bacteria in tryptone soya yeast extract broth (TSBYE) containing 3.5% salt and 0.5% salt was subsequently investigated; all bacteria were considerably more resistant at higher salt concentrations.Industrial relevance
Consumption of oysters is often associated with bacterial and viral illnesses. HP treatment is employed commercially in the USA to increase safety of oysters, but further research into the effects of this technology on the microflora and biochemical characteristics of oysters is ongoing to maximise the benefits of this treatment. In this study, the effects of HP on bacteria associated with illness in oysters and the influence of a high-salt environment on inactivation were investigated. The higher baroresistance of all bacteria in oysters than in buffer is particularly important, indicating that studies of HP-induced bacterial inactivation in buffer systems may not predict inactivation in foods.
Keywords: High pressure; Oysters; Baroresistance; Vibrio mimicus; Escherichia coli; Listeria innocua; Listeria monocytogenes

A. Mousavi, M. Sarhadi, S. Fawcett, S. Bowles, M. York, Tracking and traceability solution using a novel material handling system, Innovative Food Science & Emerging Technologies, Volume 6, Issue 1, March 2005, Pages 91-105, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.10.006.
(http://www.sciencedirect.com/science/article/B6W6D-4F3FDS4-1/2/b10dc10b19c322b4135093393576f608)
Abstract:
Tracking and traceability of products and raw material in the shopfloor has become one of the major subjects in the research arena [Montanari, D.J., & Aly, N. (1995). Inventors of methods for

tracking the production history of food products, a US registered patent system, December; Billo, R. E., & Bidanda, B. (1998). Modelling effective material tracking systems, a case study in wireless technology, Industrial Engineering Solutions 98, Proceedings, pp. 10-17; Chanet, J. P., & Eynard, P. (2000). Technologies for the traceability in the meat industry, Technical Report: Adaption Control & Information Tracing. Proceedings of the First International Meat Automation Congress MAC 2000, pp. 1-6]. Food industry is especially the focus of recent material tracking and traceability initiatives [Furness, T. (1998) Traceability in the livestock and meat products supply chain, Traceability Action UK (TAUK) Report and Recommendations, Coordinated by AIM UK (June 1998). http://www.defra.gov.uk/; Meghen, C. (2000). Traceability technologies for the meat industry, Technical Report: Adoption, Control & Information Tracing. Proceedings of the First International Meat Automation Congress MAC 2000, pp. 23-26]. One of the major areas that traceability of meat products can be compromised is at the boning and trimming stage. In this paper, the authors attempt to provide a solution for tracking and tracing meat cuts in a typical boning hall. The proposed system should be able to maintain high standards of operational fluency whilst maintaining 100% traceability. This could only be achieved by providing an operational smart material handling system that could address public health and safety concern. This paper represents the technical and innovative achievements in developing a fully operational novel conveyor concept (bead driven [Jephcott, D. L. (2002). Method and apparatus for transferring drive, Patent No. US2002057956, see web page:http://l2.espacenet.com/espacenet/bns.pdf?PN=US2002057956&ID=US2002057956A1+I+&PG=1]) and the associated SCADA system in a boning hall. It will then elaborate on the Information System (IS) designed for transferring the data collected from the shopfloor to intraorganisational data management systems.

A multistage procedure to relate a novel idea to a fully operational smart conveyor system capable of storing, maintaining, and transferring product information into complex routings of a harsh food environment is described in detail. Integration of mechanical design, electronic architecture, and radio frequency (RF) identification equipment using the state-of-the-art factory control Programmable Logic Controllers (PLC) and Supervisory Control and Data Acquisition (SCADA) suite of software is discussed. Various hardware tests, destructive or simulated, conducted to ensure maximum conformity to industry standards, are described. Specific tests were applied to the control software and Data Management System (DBMS) to maintain the integrity of the tracking and traceability system.

Although this paper and the technology developed are targeted for meat processing industry, the result can be used as a platform for other industries that require 100% traceability, e.g., pharmaceutical and aerospace industries.Industrial Relevance

This paper covers the development of a conveyor system capable of tracking and tracing food items during processing in order to minimize the risk of transfer of animal related diseases to humans. The 'Meatracˮ project has provided 100% traceability for prime cuts of meat in abattoir and boning hall.

Keywords: Tracking and traceability systems; Smart conveyor systems; Information systems; Radio frequency; SCADA; Software design; Hardware design; Digital engineering; Bead-drive

M. Serrano, D. Martinez-Romero, S. Castillo, F. Guillen, D. Valero, The use of natural antifungal compounds improves the beneficial effect of MAP in sweet cherry storage, Innovative Food Science & Emerging Technologies, Volume 6, Issue 1, March 2005, Pages 115-123, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.09.001.

(http://www.sciencedirect.com/science/article/B6W6D-4F0GBGR-1/2/61263a5e9ffde6b44568427480511326)

Abstract:

Sweet cherry shows severe problems for commercialisation mainly due to incidence of decay and a fast loss of sensory quality, both for fruit and stem. A package has been developed based on the

addition of eugenol, thymol, menthol or eucalyptol (pure essential oils) separately to trays sealed with polypropylene bags to generate a modified atmosphere (MAP). In addition, cherries in MAP (without essential oils) were selected and served as controls. All cherries were stored during 16 days at 1 [degree sign]C and 90% RH. Steady-state atmosphere was reached after 9 days of cold storage with 2-3% of CO2 and 11-12% of O2 with no significant differences between treated and control, with the exception of eucalyptol, in which significant increases in CO2 and decreases of O2 were obtained. When fruit quality parameters were determined, those treated with eugenol, thymol or menthol showed benefits in terms of reduced weight loss, delayed colour changes and maintenance of fruit firmness compared with control. Stem remained green in treated cherries while they became brown in control. However, cherries packaged with eucalyptol behaved even worst than control cherries, with generation of off-flavours, loss of quality and stem browning. Finally, the microbial analysis showed that all essential oils reduced moulds and yeasts and total aerobic mesophilic colonies by 4- and 2-log CFU compared with control, respectively. In conclusion, the use of MAP in combination with eugenol, thymol or menthol is an effective tool on maintaining cherry fruit quality and reducing the occurrence of decay.Industrial relevance
The data presented in this work suggest that the use of pure essential oils (eugenol, thymol or menthol) in combination with modified atmosphere packaging (MAP) is an innovative and useful tool as alternative to the use of synthetic fungicides in fruits and vegetables, especially for those which are highly perishable and have a short shelf-life, as cherries. These compounds have been included in the list of generally recognized as safe (GRAS) compounds by FDA. As far as we know, this is the first paper dealing on the use of natural antifungal compounds and MAP and that these combined technologies confer benefits in fruit storage and retailing, with reduction in spoilage microorganisms, maintenance of cherry quality attributes and extension of shelf-life. The effects of these natural compounds on individual microorganisms, both responsible for spoilage and food-borne pathogens, as well as the minimum concentration to gain effectiveness deserve further research.
Keywords: Prunus avium L.; Essential oils; Fruit quality; Decay; Ripening; MAP

Jose Miguel Aguilera, Why food microstructure?, Journal of Food Engineering, Volume 67, Issues 1-2, IV Iberoamerican Congress of Food Engineering (CIBIA IV), March 2005, Pages 3-11, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.050.
(http://www.sciencedirect.com/science/article/B6T8J-4D98XD0-3/2/857528f8210f5cd32cba6493ef0204ee)
Abstract:
Food technology is a controlled attempt to preserve, transform, create or destroy a structure that has been imparted by nature or processing. Nowadays food scientists and food engineers have many microscopy and imaging techniques available to probe into the structure of food and rationally design processes that enhance the quality of products. Image analysis and image processing provides the needed quantitative data for the analysis and design of food microstructure. This article discusses how food structure is related to nutrition, chemical and microbiological stability, texture and physical properties, transport properties and product engineering.
Keywords: Foods; Microstructure; Diffusion; Image analysis; Nutrition; Texture; Stability

Gerd Brunner, Supercritical fluids: technology and application to food processing, Journal of Food Engineering, Volume 67, Issues 1-2, IV Iberoamerican Congress of Food Engineering (CIBIA IV), March 2005, Pages 21-33, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.060.
(http://www.sciencedirect.com/science/article/B6T8J-4D98JSG-S/2/7749884e2ae3d1b210b8dc02971a33cc)
Abstract:

Supercritical fluids (SCFs) are substances at pressures and temperatures above their critical values. It is characteristic that properties of SCFs can be changed in a wide range. Their solvent power is the highest for non-polar or slightly polar components and decreases with increasing molecular weight. They can easily be removed from the solutes by mere expansion to ambient pressure. Carbon dioxide (CO2) is particularly advantageous for processing food materials. SCFs are used for batch extractions of solids, for multi-stage counter-current separation (fractionation) of liquids, and for adsorptive and chromatographic separations. State of the art design for commercial plants is available, and a number of installed plants are working. Special applications to food processing include decaffeination of green coffee beans, production of hops extracts, recovery of aromas and flavours from herbs and spices, extraction and fractionation of edible oils, and removal of contaminants, among others. The application of SCFs is now extended to new areas like formulation or specific chemical reactions. Costs of SCF extraction (SCFE) processes are competitive. In certain cases SCFE processing is the only way to meet product specifications.
Keywords: Supercritical fluid; Carbon dioxide; Food processing; Extraction; Separation

J. Antonio Torres, Gonzalo Velazquez, Commercial opportunities and research challenges in the high pressure processing of foods, Journal of Food Engineering, Volume 67, Issues 1-2, IV Iberoamerican Congress of Food Engineering (CIBIA IV), March 2005, Pages 95-112, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.066.
(http://www.sciencedirect.com/science/article/B6T8J-4DBCFMX-1/2/4d231c48d659cd5f15d981afa1058fd3)
Abstract:
High pressure processing (HPP) at refrigeration, ambient or moderate heating temperature can inactivate pathogenic and spoilage microorganisms with fewer changes to product 'freshness' as compared to conventional food preservation processes. The essential equipment components are here described to help define low and higher cost applications. Specific opportunities are discussed that a food processor can consider to profit from the significant equipment investment required to implement this new processing technology. Although, HPP is the only alternative processing technology that has reached consumers with a variety of new products, there are many pending research questions to be answered to make it a reliable alternative and to have a fundamental understanding of the inactivation of microorganisms and enzymes by pressure. Approaches to generate the knowledge required and the information that is being generated is critically reviewed.
Keywords: High pressure processing; Pressure intensifier; Wire-winding; Membrane damage; Spore inactivation; SASPs; Microbial inactivation models; In situ measurements

Michael T. Morrissey, Sergio Almonacid, Rethinking technology transfer, Journal of Food Engineering, Volume 67, Issues 1-2, IV Iberoamerican Congress of Food Engineering (CIBIA IV), March 2005, Pages 135-145, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.057.
(http://www.sciencedirect.com/science/article/B6T8J-4D98JSG-J/2/f18b943fea4e45542ee02b62efeeb726)
Abstract:
The needs of small and mid-size enterprises (SMEs) in the agricultural and food sectors are continually changing in the global marketplace. Technology transfer is one means of advancing SMEs to be more competitive and to embrace changes that are critical to their survival. New approaches are necessary to overcome some traditional barriers between researchers and industry for implementation of innovative technology. Universities and research centers are often ill equipped to meet these changing needs due to traditional methods of undertaking research and technology transfer. These methods are often slow and time consuming while SMEs need real-time response to technological challenges and market demands. This paper describes methods for more responsive technology transfers to SMEs through the creation of a more dynamic research

model with projects undertaken in seafood processing. Key elements in this model include engagement with SMEs and entrepreneurs at an early stage of the project, flexibility in the research plan, and access to capital for technology transfer.
Keywords: Technology transfer; Ohmic heating; High pressure; Traceability

Stella M. Alzamora, Daniela Salvatori, Maria S. Tapia, Aurelio Lopez-Malo, Jorge Welti-Chanes, Pedro Fito, Novel functional foods from vegetable matrices impregnated with biologically active compounds, Journal of Food Engineering, Volume 67, Issues 1-2, IV Iberoamerican Congress of Food Engineering (CIBIA IV), March 2005, Pages 205-214, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.067.
(http://www.sciencedirect.com/science/article/B6T8J-4DNPVN3-2/2/1cb3d6ac6aac71af3bcd2d0c537c03b5)
Abstract:
Functional foods affect beneficially one or more target functions in the body, beyond adequate nutritional effects, to either improve stage of health and well-being and/or reduce the risk of disease. Lastly, the range of functional foods has grown tremendously. One of the main objectives of the multinational collaborative project entitled 'Emerging preservation techniques for foods of concern in Ibero-America' (CYTED Program), carried out from 1999 to 2004, was to analyze the feasibility of atmospheric and/or in vacuum impregnation treatments to incorporate physiologically active compounds into plant tissues without destroying the initial food matrix. This contribution brings together report of progress in the development of functional fruit and vegetable matrices enriched with probiotics and minerals (calcium and zinc). Main aspects discussed are the kinetics of matrix fortification, the viability of some active compounds and the interactions between calcium, the cell structure and the mechanical properties of fruit and vegetable tissues. Vacuum and/or atmospheric impregnation techniques seem to be feasible technologies for exploitations of fruit and vegetable tissues as new matrices into which functional ingredients can be successfully incorporated, providing novel functional product categories and new commercial opportunities.
Keywords: Functional foods; Vegetable matrix; Mineral and probiotics fortification; Impregnation

R. Deliza, A. Rosenthal, F.B.D. Abadio, Carlos H.O. Silva, C. Castillo, Application of high pressure technology in the fruit juice processing: benefits perceived by consumers, Journal of Food Engineering, Volume 67, Issues 1-2, IV Iberoamerican Congress of Food Engineering (CIBIA IV), March 2005, Pages 241-246, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.05.068.
(http://www.sciencedirect.com/science/article/B6T8J-4D98JSG-W/2/a1cec3c651bb7a4073aaf5e311d9b590)
Abstract:
The use of high hydrostatic pressure in food processing is of great interest because of its ability to inactivate food borne micro-organisms and enzymes, at low temperature, without the need for chemical preservatives. Pressure-treated foods have sensory properties similar to fresh products, which is a major advantage in juice processing as it matches consumer demand for healthy, nutritious and 'natural' products. However, an important issue rises when we consider the acceptance of such products by the consumer. This paper discusses the use of pressure processing in fruit juice production from a consumer perspective, focusing on the Brazilian consumer perception and attitude, with respect to information presented on the fruit juice label about the technology. The results have shown that when the technology advantages were presented on pineapple juice labels, participants understood the benefits, and expressed a higher product intention to purchase.
Keywords: High pressure technology; Consumer; Fruit juice

C. Matthys, M. Bilau, Y. Govaert, E. Moons, S. De Henauw, J.L. Willems, Risk assessment of dietary acrylamide intake in Flemish adolescents, Food and Chemical Toxicology, Volume 43, Issue 2, February 2005, Pages 271-278, ISSN 0278-6915, DOI: 10.1016/j.fct.2004.10.003.
(http://www.sciencedirect.com/science/article/B6T6P-4DTBR1N-3/2/b388dc742ca5efd2715448263c9a043f)
Abstract:
Acrylamide has recently been found in a range of heat treated food items. As it is a neurotoxic agent and a probable, human carcinogen (IARC 2A), human exposure to this chemical might constitute an important public health issue. The purpose of the study was to estimate the acrylamide intake in Flemish adolescents (based on 7-day food record) and to evaluate the possible health risks due to the exposure. The Belgian Federal Agency for the Safety of the Food Chain collected 150 food items from different supermarkets and restaurants to analyse the acrylamide level. The limit of quantitation was 30 [mu]g acrylamide/kg foodstuffs. Exposure modelling was based on Monte Carlo simulations. The estimated dietary intake of acrylamide per person given as the 5th, 50th and 95th percentile were 0.19, 0.51 and 1.09 [mu]g/kg bw/d. Bread, despite its low acrylamide content, is relevant as a source of acrylamide exposure at the lower percentiles. At higher percentiles the contribution of French fries and crisps is more important. It must be emphasised that the exposure assessment has several limitations. Risk of neurotoxicity seems negligible. The relevance of current intake levels in terms of cancer risk remains a subject of debate.
Keywords: Acrylamide; Dietary intake; Risk assessment; Exposure

F. Moerman, High hydrostatic pressure inactivation of vegetative microorganisms, aerobic and anaerobic spores in pork Marengo, a low acidic particulate food product, Meat Science, Volume 69, Issue 2, February 2005, Pages 225-232, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2004.07.001.
(http://www.sciencedirect.com/science/article/B6T9G-4D98JYP-1/2/6cbac88fc0fd913d9b70a1801d2ab956)
Abstract:
To prolong the shelf-life of particulate food products, high pressure processing is one of the emerging technologies to be studied as an alternative to classical pasteurization and sterilization by heat. Pork Marengo (a low acidic, partially prepared stew of pieces pork, carrots and peas) was inoculated with several strains of sporulating and vegetative microorganisms. The microbial spoilage of the product was evaluated after a high pressure treatment of 400 MPa during 30 min at, respectively, 20 and 50 [degree sign]C. Several Clostridium spp. and Bacillus spp. survived the treatment, and the Gram-positive cocci Enterococcus faecalis and Staphylococcus aureus were revealed to be more pressure resistant than Saccharomyces cerevisiae and the Gram-negative bacteria Pseudomonas fluorescens and Escherichia coli. The high pressure treatment at 20 [degree sign]C demonstrated that high pressure processing (HPP) of neutral-pH foods cannot rely on pressure alone as a pasteurization/sterilization process. Another physical agent like heat is needed. High pressure treatment at 50 [degree sign]C demonstrated that heat transfer limitations in particulate food products still can trouble their successful pasteurization/sterilization.

L.A. Bouwman, J. Bloem, P.F.A.M. Romkens, J. Japenga, EDGA amendment of slightly heavy metal loaded soil affects heavy metal solubility, crop growth and microbivorous nematodes but not bacteria and herbivorous nematodes, Soil Biology and Biochemistry, Volume 37, Issue 2, February 2005, Pages 271-278, ISSN 0038-0717, DOI: 10.1016/j.soilbio.2004.07.039.
(http://www.sciencedirect.com/science/article/B6TC7-4D97D89-1/2/7fae416427ca5798c538913efea87d3b)
Abstract:

Phytoextraction of heavy metals is a promising technology to remediate slightly and moderately contaminated soils. To enhance crops' uptake of heavy metals, chelates such as EDGA are being tested as soil additives. Heavy metal loaded EDGA can affect soil organisms such as bacteria and nematodes in various ways: directly via the soil solution surrounding the organisms and indirectly by changing the approachability, amount and quality of specific food items for nematodes and bacteria. In a pot experiment with various crops growing in slightly polluted acid sandy soil (pH 4.5, 2 mg Cd and 200 mg Zn kg-1 soil), Cd and Zn loaded EDGA in the soil solution did not affect herbivorous nematodes but did strongly reduce the increase in bacterivorous nematodes. Moreover, while the crop-stimulated increase in numbers of bacterivorous nematodes dropped, the measured amounts and the growth of their food (bacteria) were not reduced. This differential effect of the EDGA addition occurred under moderate (grass) and strong (lupine and yellow mustard) stimulation of bacterivorous nematodes by the crops, and of moderate (grass, yellow mustard) and no (lupine) stimulation of herbivorous nematodes. We assume that EDGA addition did not increase the load of bacteria with adsorbed heavy metals. Probably the bacterivorous nematodes were inhibited to feed by the high concentration of heavy metal-complexed EDGA in the soil solution, also surrounding their prey (bacteria). Although EDGA addition to the soil stimulated uptake of heavy metals by the crops, it decreased heavy metal concentrations in the roots. Herbivorous nematodes were therefore not negatively affected by the EDGA addition to the soil. Fungivorous nematodes were negatively affected by EDGA addition, probably due to increased heavy metal concentrations in the fungal hyphae. Thus, EDGA can have significant side effects on the functioning of the soil organisms, and a thorough analysis of trophic relationships among soil organisms is needed to understand these effects.
Keywords: Bacteria; Bacterivorous nematodes; Cadmium; EDGA; Herbivorous nematodes; Phytoextraction; Zinc

Roger J. Gerrits, Joan K. Lunney, Lawrence A. Johnson, Vernon G. Pursel, Robert R. Kraeling, Gary A. Rohrer, John R. Dobrinsky, Perspectives for artificial insemination and genomics to improve global swine populations, Theriogenology, Volume 63, Issue 2, Proceedings of the V International Conference on Boar Semen Preservation, 15 January 2005, Pages 283-299, ISSN 0093-691X, DOI: 10.1016/j.theriogenology.2004.09.013.
(http://www.sciencedirect.com/science/article/B6TCM-4DT2KXP-1/2/f9e698e5e719be0ecd328bb173253108)
Abstract:
Civilizations throughout the world continue to depend on pig meat as an important food source. Approximately 40% of the red meat consumed annually worldwide (94 million metric tons) is pig meat. Pig numbers (940 million) and consumption have increased consistent with the increasing world population (FAO 2002). In the past 50 years, research guided genetic selection and nutrition programs have had a major impact on improving carcass composition and efficiency of production in swine. The use of artificial insemination (AI) in Europe has also had a major impact on pig improvement in the past 35 years and more recently in the USA. Several scientific advances in gamete physiology and/or manipulation have been successfully utilized while others are just beginning to be applied at the production level. Semen extenders that permit the use of fresh semen for more than 5 days post-collection are largely responsible for the success of AI in pigs worldwide. Transfer of the best genetics has been enabled by use of AI with fresh semen, and to some extent, by use of AI with frozen semen over the past 25 years. Sexed semen, now a reality, has the potential for increasing the rate of genetic progress in AI programs when used in conjunction with newly developed low sperm number insemination technology. Embryo cryopreservation provides opportunities for international transport of maternal germplasm worldwide; non-surgical transfer of viable embryos in practice is nearing reality. While production of transgenic animals has been successful, the low level of efficiency in producing these animals and lack of information on multigene interactions limit the use of the technology in applied

production systems. Technologies based on research in functional genomics, proteomics and cloning have significant potential, but considerable research effort will be required before they can be utilized for AI in pig production. In the past 15 years, there has been a coordinated worldwide scientific effort to develop the genetic linkage map of the pig with the goal of identifying pigs with genetic alleles that result in improved growth rate, carcass quality, and reproductive performance. Molecular genetic tests have been developed to select pigs with improved traits such as removal of the porcine stress (RYR1) syndrome, and selection for specific estrogen receptor (ESR) alleles. Less progress has been made in developing routine tests related to diseases. Major research in genomics is being pursued to improve the efficiency of selection for healthier pigs with disease resistance properties. The sequencing of the genome of the pig to identify new genes and unique regulatory elements holds great promise to provide new information that can be used in pig production. AI, in vitro embryo production and embryo transfer will be the preferred means of implementing these new technologies to enhance efficiency of pig production in the future.
Keywords: Genomics; Artificial insemination; Reproduction; Disease resistance; Semen; Embryos

K. J. Shiny, K. N. Remani, E. Nirmala, T. K. Jalaja, V. K. Sasidharan, Biotreatment of wastewater using aquatic invertebrates, Daphnia magna and Paramecium caudatum, Bioresource Technology, Volume 96, Issue 1, January 2005, Pages 55-58, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.01.008.
(http://www.sciencedirect.com/science/article/B6V24-4D58C61-1/2/15ccd06001a1a01e552924554673fc4b)
Abstract:
A number of major changes have occurred over the past few years, which give cause for a re-examination of conventional wastewater treatment methods. Among these are growing problems of worldwide energy and food shortages and nutrients not removed by conventional secondary processes causing algal blooms and other problems in the receiving waters. The global increase in wastewater calls for innovative low cost technology approaches to its recycling. Biotreatment systems, utilizing living organisms are receiving growing attention since they are ecologically sound, cheap and applicable in areas without land constraints. Filter feeders (both invertebrates and vertebrates) are promising in this area since they can remove suspended organic matter and bacteria, even in the size range of microns. In the present study biological treatment of municipal wastewater using two invertebrates--Paramecium caudatum, a protozoan and Daphnia magna, a cladoceran was investigated. Analysis at pre-experimental and post-experimental stages revealed the potential of these species in abatement of water pollution. D. magna was more efficient than P. caudatum in laboratory-scale studies.
Keywords: Aquatic treatment systems; Biochemical oxygen demand; Coliform bacteria; Paramecium caudatum; Daphnia magna; Biological treatment

Pauline Leverrier, Yoann Fremont, Annette Rouault, Patrick Boyaval, Gwenael Jan, In vitro tolerance to digestive stresses of propionibacteria: influence of food matrices, Food Microbiology, Volume 22, Issue 1, January 2005, Pages 11-18, ISSN 0740-0020, DOI: 10.1016/j.fm.2004.05.003.
(http://www.sciencedirect.com/science/article/B6WFP-4D5FVCK-2/2/6721e3227c83021eef569f4d9d2dcb39)
Abstract:
This study investigated Propionibacterium freudenreichii tolerance to stresses encountered during food technology or in the digestive tract. The impact of food matrices on stress survival was evaluated. The ability of P. freudenreichii strains SI 41 and CNRZ 81 to survive both acid and bile salts stresses was studied in vitro. Stress tolerance was examined after inclusion of bacteria in different food matrices (alginate beads, xanthan-gellan beads, fermented milk) and compared to the stress tolerance of the same strains in pure cultures (either in exponential growth phase, in

stationary phase, or after freeze-drying). Fermented milk was determined as the best probiotic vector to protect propionibacteria from this trial. This in vitro investigation gave promising results. Indeed, some food matrices can significantly improve protection of bacterial cells from stress injury. These data, which should be confirmed in an in vivo study, will be taken into consideration for the improvement of technological processes and for the choice of an adequate probiotic vector.
Keywords: Propionibacterium; Probiotic vector; Fermented milks; Digestive stress

Alan P. Rudy, Imperial contradictions: is the Valley a watershed, region, or cyborg?, Journal of Rural Studies, Volume 21, Issue 1, January 2005, Pages 19-38, ISSN 0743-0167, DOI: 10.1016/j.jrurstud.2004.07.005.
(http://www.sciencedirect.com/science/article/B6VD9-4DDR5XX-1/2/a6e3c681c4dd7e54f15606ca5121e6fa)
Abstract:
Is California's Imperial Valley a watershed? If so, at what level and by what topographic logic? Is it a region? If so, at what level and by what geographic logic? Are its boundaries natural, political, or multivalent on different scales? In short, this essay looks at the special (re)production of environmental conditions within a cyborg world. Here, the Valley is comprised of (a) Colorado River water; (2) migratory waterfowl; (3) the accidentally manufactured, but intentionally seeded food chain of the Salton Sea (3) the San Andreas Fault, (4) Mexican field labor; (5) public universities extension services; (6) global markets and supply chains; (7) international biotechnology, chemical and seed conglomerates, and (8) state and federal regulation of water rights, regulations and markets. The Valley is a cyborg, a historical entity comprised interdependently of nature, technoscience and humanity. This, characterization, however, raises problems with conceptions of the massive losses of migratory waterfowl from avian cholera at the Salton Sea, the agroecological devastation caused by the unintentional introduction of the Silver Leaf whitefly, and the 'wastage' of constrained water rights as environmental crises of nature. The articulation of a cyborg perspective sees the environmental conditions of the Valley as the product of relations comprised of uneven and indeterminate ecological process, technoscientific trajectories, and human practices. Extending the cyborg's integration of nature, technology and social agency, a relational reading of James O'Connor's second contradiction of capitalism thesis is developed. O'Connor's political ecology and Haraway material semiotics, while broadly operating at different levels of analysis, prove surprisingly resonant.

F. N. Muchena, D. D. Onduru, G. N. Gachini, A. de Jager, Turning the tides of soil degradation in Africa: capturing the reality and exploring opportunities, Land Use Policy, Volume 22, Issue 1, Soil degredation in Sub-Saharan Africa, January 2005, Pages 23-31, ISSN 0264-8377, DOI: 10.1016/j.landusepol.2003.07.001.
(http://www.sciencedirect.com/science/article/B6VB0-4BVP4V4-4/2/ddaa1930009dc7cb5b912948bdefa10d)
Abstract:
Soil degradation means loss of biological and economic productivity of the land. Measurements of land degradation need to take cognizance of land properties (e.g. soil, water and vegetation) as well as productivity indicators. While land degradation in sub-Saharan Africa is a subject of an on-going debate, conflicting perspectives arise about its extent at regional and at lower scales, about methodologies and robustness of indicators and the impacts of past and present degradation on food security, about rural livelihoods in general, and on African posterity. This paper presents evidence of land degradation from selected case studies across East Africa, and analyses them against the robustness of indicators used at regional, national and lower scales in order to unravel the hidden myths and realities of land degradation. The results are corroborated against time-series such as yields of major crops, environmental data (rainfall, soil fertility) and management data. Land degradation assessments need to move away from empty rhetoric to capturing reality

by integrating effects of farm management practices and technologies, including their social and institutional dimensions, on soil loss, yields and nutrient budgets. Influencing factors and socio-economic environments surrounding land degradation and the specific environments under which degradation takes place should not be overlooked.
Keywords: East Africa; Land degradation; Soil fertility; Conflicting perspectives; Rural livelihoods

A. de Jager, Participatory technology, policy and institutional development to address soil fertility degradation in Africa, Land Use Policy, Volume 22, Issue 1, Soil degredation in Sub-Saharan Africa, January 2005, Pages 57-66, ISSN 0264-8377, DOI: 10.1016/j.landusepol.2003.06.002.
(http://www.sciencedirect.com/science/article/B6VB0-4BVPSR6-1/2/63f1b67c85ca7ab76b38fe64eedbc2bd)
Abstract:
At global scale nutrient flows are unbalanced, resulting in huge surpluses in Western Europe versus negative balances in Africa. Existing policy and socio-economic environments in different parts of the world are the major cause of this situation. At lower spatial scales, a much more complex and diverse picture emerges. In Sub-Saharan Africa, different levels and causes of soil fertility decline are found among agro-ecological zones, soil types, farm systems, wealth groups, urban-rural households, cash and food crops, home fields and bush fields.
Technology development has been the traditional response to address nutrient imbalances in general, and soil fertility decline in Africa in particular. Farm households have continued to develop and adapt existing technology to changing situations. National and international research institutions have followed a variety of changing approaches of which the recently developed participatory approaches have yielded some impressive results in isolated cases. These efforts have, however, not led to the necessary massive reversion of the trend in soil fertility decline. The Dutch policies on nutrient use and the Indonesian policy to adopt Integrated Pest Management are two examples, associated with such major trend reversions. This suggests that promoting and supporting participatory technologies have limited impact when no attention is paid to participatory policy development and implementation.
In order to mobilise farm households in a trend reversion, a number of conditions should be met such as stable prices for agricultural outputs, better input/output prices ratios, influence of land users on the research agenda and private-public initiatives focused on smallholders.
This observation calls for the establishment of interactive landusers-science-policy triangles at various scales (local, national and international) in which joint learning and mediating may lead to more informed decision making, more focused design of an agricultural sector policy, implementation of policies by effective institutions, and appropriate technology development and implementation. Interventions need to be reoriented: less technology development, more policy influence and institution building.
Keywords: Soil fertility degradation; Policy; Institutional development; Africa

Walter P. Hammes, Markus J. Brandt, Kerstin L. Francis, Julia Rosenheim, Michael F.H. Seitter, Stephanie A. Vogelmann, Microbial ecology of cereal fermentations, Trends in Food Science & Technology, Volume 16, Issues 1-3, Second International Symposium on Sourdough - From Fundamentals to Applications, January-March 2005, Pages 4-11, ISSN 0924-2244, DOI: 10.1016/j.tifs.2004.02.010.
(http://www.sciencedirect.com/science/article/B6VHY-4FH0W5J-1/2/1d5cfe1ef575278959d92d024423b4d1)
Abstract:
Cereals are globally number one as food crops as well as substrates for fermentation. Well known products are beer, sake, spirits, malt vinegar, and baked goods made from doughs leavened by yeasts or sourdough. Fermentation processes are enabled by technological measures that act on the metabolically resting grains and direct ecological factors controlling the activity of lactic acid

bacteria and yeasts. Fermentable substrates originate from endogenous or added hydrolytic enzyme activities. Examples of their management are malting, koji technology, addition of enzymes from external sources and sourdough, which stands on the origin of all fermentation. When sourdough is continuously propagated under the conditions applied in bakery practice, a stable association of only few species of lactic acid bacteria (LAB) and yeasts achieve dominance and ensure a controlled process. The variation of the ecological parameters acting on the microbial association such as the nature of cereal, temperature, size of inoculum, and length of propagation intervals leads in each case to a characteristic species association, thus explaining that altogether 46 LAB species and 13 yeast species have been identified as sourdough specific.

, Trends in Food Science and Technology, Trends in Food Science & Technology, Volume 16, Issues 1-3, Second International Symposium on Sourdough - From Fundamentals to Applications, January-March 2005, Pages 121-123, ISSN 0924-2244, DOI: 10.1016/j.tifs.2005.01.004.
(http://www.sciencedirect.com/science/article/B6VHY-4FJTP02-1/2/1566533861d305fdf4049312df4100ab)

Gregory L. Rorrer, Donald P. Cheney, Bioprocess engineering of cell and tissue cultures for marine seaweeds, Aquacultural Engineering, Volume 32, Issue 1, 2003 Aquacultural Engineering Society Issues Forum, December 2004, Pages 11-41, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2004.03.007.
(http://www.sciencedirect.com/science/article/B6T4C-4CHRHVH-1/2/daa34333d1cde061118aa66f33b5e3d0)
Abstract:
Seaweeds are a rich source of valuable compounds including food additives and biomedicinals. The bioprocess engineering of marine macroalgae or 'seaweeds' for the production of these compounds is an emerging area of marine biotechnology. Bioprocess technology for marine macroalgae has three elements: cell and tissue culture development, photobioreactor design, and identification of strategies for eliciting secondary metabolite biosynthesis. In this paper, the first two elements are presented. Firstly, the development of phototrophic cell and tissue culture systems for representative species within brown, green, and red macroalgae is described. In vitro culture platforms include microscopic gametophytes, undifferentiated callus filaments, and 'microplantlets' regenerated from callus. Secondly, the controlled cultivation of these phototrophic culture systems in stirred tank, bubble-column, airlift, and tubular photobioreactors is described. Limiting factors on biomass production in photobioreactors including light delivery, CO2 transfer, and macronutrient delivery are compared. Finally, a mathematical model that integrates light delivery, CO2 delivery, and macronutrient delivery into the material balance equations for biomass production in a perfusion bubble-column photobioreactor is presented, and model predictions are compared to biomass production data for microplantlet suspension cultures of the model red alga Agardhiella subulata.
Keywords: Cell and tissue culture; Macroalgae; Photobioreactor

Mohammed Mohaibes, Helvi Heinonen-Tanski, Aerobic thermophilic treatment of farm slurry and food wastes, Bioresource Technology, Volume 95, Issue 3, December 2004, Pages 245-254, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.02.022.
(http://www.sciencedirect.com/science/article/B6V24-4C4W4BJ-2/2/c1061e93ce0385576b29324e81b68d6c)
Abstract:
The review discusses the aerobic treatments for farm slurry and food wastes and concentrates in particular on the thermophilic aerobic treatments. Methods are discussed under the heading of chemical, physical and other treatments. From those methods considered, the most suitable physical-microbiological treatment are aerobic thermophilic treatments. The main problem faced in

aerobic thermophilic treatments could be the foaming formation during the process, and this could be solved by using different methods, mainly mechanical control method. Aerobic thermophilic treatments are also simple, economical and environmentally accepted. This method is known to have effects, and could be used to assist decontaminations on farms, as such technologies are already used in routine slurry treatment in many farms.
Keywords: Slurry; Aerobic; Psychrophilic; Thermophilic; Foaming; Review

Noah Zerbe, Feeding the famine? American food aid and the GMO debate in Southern Africa, Food Policy, Volume 29, Issue 6, December 2004, Pages 593-608, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2004.09.002.
(http://www.sciencedirect.com/science/article/B6VCB-4DTKYXP-1/2/dfd44aaa675f38a60bac43edc1a48c03)
Abstract:
The inclusion of genetically modified maize in food aid shipments to Southern Africa during the 2002 food crisis rekindled debates over agricultural biotechnology. As the region edged ever closer to famine - putting the lives to some 14 million Africans at risk - corporate pundits, government officials and biotech's critics debated the health and environmental dangers posed by the new technology.
By situating the decision to send genetically modified maize to Southern Africa in the context of US-European debates over agricultural biotechnology, it becomes clear that the promotion of biotechnology has nothing to do with ending hunger in the region. Indeed, American food aid shipments to Southern Africa have little to do with the famine at all. Instead, I argue that US food aid policy following the 2002 crisis was intended to promote the adoption of biotech crops in Southern Africa, expanding the market access and control of transnational corporations and undermining local smallholder production thereby fostering greater food insecurity on the Continent.
Keywords: 2002 food crisis; Southern Africa; Biotechnology; Food aid; Food security

M.A. Ayadi, J.C. Leuliet, F. Chopard, M. Berthou, M. Lebouche, Electrical Conductivity of Whey Protein Deposit: Xanthan Gum Effect on Temperature Dependency, Food and Bioproducts Processing, Volume 82, Issue 4, December 2004, Pages 320-325, ISSN 0960-3085, DOI: 10.1205/fbio.82.4.320.56398.
(http://www.sciencedirect.com/science/article/B8JGD-4RSJN40-9/2/874487f87a1205b0c158b11083f75699)
Abstract:
Protein-polysaccharide mixtures are widely used in the food industry as they play an essential role in the structure, texture and stability of many foodstuffs. The electrical conductivity is a key parameter in ohmic heating technology. The temperature dependence of the electrical conductivity of two fouling model fluids was studied at neutral pH, between 10[degree sign]C and 100[degree sign]C. The differences observed in the thermograms were attributed to the interaction between protein and xanthan gum molecules. The electrical conductivity of the deposit generated by ohmic heating of these model fluids was measured between 10[degree sign]C and 120 [degree sign]C. The marked differences between the conductivity of each deposit and the fluids could be related to observable differences in microstructure.
Keywords: electrical conductivity; [beta]-lactoglobulin-xanthan gum interaction; ohmic heating technology; fouling

Arnab Sarkar, R. Paul Singh, Air impingement technology for food processing: visualization studies, Lebensmittel-Wissenschaft und-Technologie, Volume 37, Issue 8, December 2004, Pages 873-879, ISSN 0023-6438, DOI: 10.1016/j.lwt.2004.04.005.

(http://www.sciencedirect.com/science/article/B6WMV-4CHRFDD-2/2/62942bd28fb8ee3e2974252f16106287)
Abstract:
Food processing systems using air impingement consist of jets of high-velocity air (10-100 m/s) exiting from nozzles and impinging on a food product. The factors affecting efficiency of impingement systems include the nozzle exit velocity, nozzle design, boundary layer characteristics on the surface of the product and the design of the impingement equipment. In the present research, visualization studies were conducted to determine the importance and implication of these factors. Flow under the jets was visualized using planar flow visualization techniques for various nozzle diameters (D), lengths (L) and nozzle to plate spacings (H) for flow over flat surfaces and food products with single and double jets. Studies were conducted on the transition features, recirculation, confinement and boundary layer flow characteristics. Ideal range for the characteristic nondimensional ratio (H/D) was determined to be 6-8. The actual ratio will depend on the transition effect and the induction of turbulence in the jet wake, which depends on the Reynolds number (Re) based on nozzle exit conditions and the L/D ratio of the nozzle. Surface roughness affected the roughness Reynolds number (Rep) which in turn influenced the boundary layer characteristics.
Keywords: Air impingement; Visualization; Flow field; Jets

Liyun Zheng, Da-Wen Sun, Vacuum cooling for the food industry--a review of recent research advances, Trends in Food Science & Technology, Volume 15, Issue 12, December 2004, Pages 555-568, ISSN 0924-2244, DOI: 10.1016/j.tifs.2004.09.002.
(http://www.sciencedirect.com/science/article/B6VHY-4DTP343-1/2/f3ee16b3f152aa92402715ad3eddfb74)
Abstract:
Vacuum cooling is a rapid evaporative cooling technique for moist and porous products. Traditionally, it is used in the food processing industry for pre-cooling of leafy vegetables and mushroom. In the past decade, its application has been extended to other sectors of the food industry, e.g. bakery, fishery, sauces and particulate foods processing. The advantages of vacuum cooling include short processing time, extension of product shelf life and improvement of product quality and safety, which have encouraged food research engineers and scientists to explore its wider applications. This paper reviews the latest research progresses made in the past few years, especially the research results from the Food Refrigeration and Computerised Food Technology (FRCFT) Research Group in National University of Ireland, which have carried out extensive research work since 1997 funded by the EU Non-Commissioned Food Research Programme and the Food Institutional Research Measures administered by the Department of Agriculture and Food of Ireland. These results indicate that significant advances have been made for vacuum cooling of cooked meats. Extensive amount of the research work was conducted with regards to cooling rate, yield, product quality and factors that improve process efficiency and product quality. Research results show that vacuum cooling significantly reduced cooling time required for cooked meat while only caused slight cost to product quality. The results also demonstrate that vacuum cooling is the only cooling method that meets the cook-chill guidelines issued by many European governments. Another major new application explored for vacuum cooling is its use in ready meals manufacturing. Research work on ready meals is still ongoing, however, current results show that this technique is a potential cooling treatment to be integrated into the processing procedures. In addition to these new applications, good progresses were also made in mathematical modelling of vacuum cooling of both liquid and solid foods. These research advances together as anticipated will eventually make this new cooling technique more competitive for the food processing industry.

Sandeep K. Sharma, Shailendra K. Singh, Neeta Sehgal, Ashok Kumar, Biostrip technique for detection of galactose in dairy foods, Food Chemistry, Volume 88, Issue 2, November 2004, Pages 299-303, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2004.03.052.
(http://www.sciencedirect.com/science/article/B6T6R-4CHHR3J-2/2/dc9d8142d22162adab92f086074c30f0)
Abstract:
A quick and simple biostrip technique for detection of galactose in food was developed by immobilizing galactose oxidase, peroxidase and chromogens on to a polymeric support. The biostrip changes its colour from yellowish white to dark green depending on the concentrations of galactose in milk or milk products. The developed colour on the strip is compared with the colour chart and the concentration of galactose in the sample is estimated. The working range of the strip is between 10 and 50 g galactose l-1 and the response time is 2 min. The technology can be used in dairies, hospitals and remote areas where sophisticated instruments are not available.
Keywords: Biostrip; Chromogen; Galactose; Galactose oxidase; Galactosemia

Semih Otles, Ata Onal, Computer-aided engineering softwares in the food industry, Journal of Food Engineering, Volume 65, Issue 2, November 2004, Pages 311-315, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.01.014.
(http://www.sciencedirect.com/science/article/B6T8J-4BY3X0B-1/2/c45335ced213d2b0da3d3a91372ac143)
Abstract:
Food science and engineering traditionally have been the basis for the development of the process technology related to the manufacture of foods. While these disciplines remain important, new challenges for the food industry have created an incentive to explore the potential of recent advances in computer-aided engineering. Such challenges include consistent quality, productivity, safety, and environmental and consumer friendliness. In this paper, we briefly describe a number of food engineering tasks for which computers and food engineering principles which can provide powerful aids are outlined, and the fundamental and practical problems associated with these tasks are identified. Examples of our experience with theoretical and applied developments for specific food engineering software are provided.

Jeremy Trimpey, Carole Engle, David Heikes, Kenneth B. Davis, Andy Goodwin, A comparison of new in-pond grading technology to live-car grading for food-sized channel catfish (Ictalurus punctatus), Aquacultural Engineering, Volume 31, Issues 3-4, October 2004, Pages 263-276, ISSN 0144-8609, DOI: 10.1016/j.aquaeng.2004.05.003.
(http://www.sciencedirect.com/science/article/B6T4C-4CSP4KJ-1/2/9c78ba42cda9c7099d6a1b5fb04af9d3)
Abstract:
Grading trials were performed in experimental and commercial catfish ponds to compare an in-pond horizontal floating bar grader to current live-car grading. Three replicate trials were conducted in experimental ponds at three different temperature ranges (warm, >26 [degree sign]C; cool, 13-26 [degree sign]C; cold, <13 [degree sign]C) with catfish size groups stocked in ratios of either 75:25, 50:50, or 25:75 sub-marketable (<0.57 kg) to marketable fish (>=0.57 kg). Commercial pond trials were replicated three times at each temperature range with a fish size range typical of ponds ready to harvest. Stress experienced by fish during harvest and grading was measured by mean serum glucose and cortisol levels. Grading speed was greater ($P < 0.05$) with the UAPB grader (105-449 kg/min) than the traditional live-car grader (0.5-0.6 kg/min). The UAPB grader decreased ($P < 0.05$) the proportion of sub-marketable fish during all trials. In contrast, the live car did not reduce the proportion of sub-marketable fish with the experimental methods used in this study during commercial trials or in the 25:75 distributions during warm and cold temperature trials in experimental ponds. The UAPB grader returned an average two to four

times (range of 2-52) more sub-marketable fish by weight to the pond than the traditional live car method. Glucose and cortisol levels in fish graded with the two technologies were not significantly different. The UAPB grader sorted fish more accurately, consistently, and quickly than the live car at all temperatures in both experimental and commercial trials.
Keywords: Live car; Mechanical grader; Channel catfish; Stress

M.V Selma, M.C Salmeron, M Valero, P.S Fernandez, Control of Lactobacillus plantarum and Escherichia coli by pulsed electric fields in MRS Broth, Nutrient Broth and orange-carrot juice, Food Microbiology, Volume 21, Issue 5, October 2004, Pages 519-525, ISSN 0740-0020, DOI: 10.1016/j.fm.2003.12.004.
(http://www.sciencedirect.com/science/article/B6WFP-4C5YD5Y-4/2/1326401144a4ea2e350752bafe32dd2f)
Abstract:
Pulsed electric fields (PEF) are an emerging non-thermal treatment valid for liquid foods. This novel technology offers a relevant alternative to traditional thermal methods avoiding thermal damage to the product (loss of flavour and nutritional value). The aim of this work was to evaluate the influence of PEF treatment conditions, inoculum size (initial cell concentration) and substrate conditions after PEF treatment on the inactivation and potential growth of Lactobacillus plantarum and Escherichia coli in orange-carrot juice. Although a maximum inactivation of 1.3 and 2.6 log reductions were achieved for L. plantarum and E. coli, respectively, after PEF treatment, it was effective inducing sub-lethal injury. An increase in the lag-phase duration was evidenced under refrigeration conditions. When sub-lethal damage could be repaired, the subsequent growth rate was not affected. An increased inhibitory effect of PEF, low temperature and low inoculum size on the delay in lag phase was observed.
Keywords: Pulsed electric field processing; Lactobacillus plantarum; Escherichia coli; Juice

Ana S. Carvalho, Joana Silva, Peter Ho, Paula Teixeira, F. Xavier Malcata, Paul Gibbs, Relevant factors for the preparation of freeze-dried lactic acid bacteria, International Dairy Journal, Volume 14, Issue 10, October 2004, Pages 835-847, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2004.02.001.
(http://www.sciencedirect.com/science/article/B6T7C-4C6KSK6-1/2/e004d4d085fd279bf61dabed5b43e32e)
Abstract:
The industrial exploitation of lactic acid bacteria (LAB) as starter and/or probiotic cultures depends strongly on the preservation technologies employed, which are required to guarantee long-term delivery of stable cultures in terms of viability and activity. Freeze-dried preparations exhibit advantages relative to preparations made with other techniques in terms of long-term preservation, coupled with convenience in handling, storage, marketing and application. Degrees of survival of LAB cultures as high as possible, during drying and subsequent storage, are thus of nuclear importance, both technologically and economically.
This review covers several factors, deemed relevant for preservation of freeze-dried LAB. The state of the art of the knowledge focussed on the improvement of LAB survival during freeze-drying and subsequent storage is presented, including specific discussion of the effects of (i) intrinsic factors, (ii) growth factors, (iii) sub-lethal treatments, (iv) drying media and (v) storage and rehydration.
Keywords: Starter culture; Preservation; Dairy foods; Fermented foods; Microorganisms

Tessa Avermaete, Jacques Viaene &, Eleanor J. Morgan with, Eamonn Pitts, Nick Crawford, Denise Mahon, Determinants of product and process innovation in small food manufacturing firms, Trends in Food Science & Technology, Volume 15, Issue 10, October 2004, Pages 474-483, ISSN 0924-2244, DOI: 10.1016/j.tifs.2004.04.005.

(http://www.sciencedirect.com/science/article/B6VHY-4D2XFY3-1/2/25fcdf087821b289f816064baef5acf0)
Abstract:
The paper examines the determinants of product and process innovation in small food manufacturing firms. Small food manufacturing firms are generally viewed as operating in a mature and low technology area, where R&D activities are limited and patenting is rare. This research is based on an in-depth survey among 177 firms located in six rural areas in the EU. Four groups of firms are identified: non-innovators, traditionals, followers and leaders. Multiple logistic regression is developed to identify the drivers of product and process innovation in the firms. The results highlight the key role of the skills of the workforce, the firm's investment in know-how and the use of external sources of information. There is, however, no evidence of a significant relationship between the characteristics of the entrepreneur and the firm's innovation performance.

John F. Kennedy, Francois Meullenet, Fundamentals of food reaction technology: R. Earle, M. Earle; Royal Society of Chemistry, Cambridge, UK, and Leatherhead International Ltd, Leatherhead, UK, 2003, x+188 pages, ISBN 1-904007-53-8, [pound sign]39.50, Carbohydrate Polymers, Volume 57, Issue 3, 13 September 2004, Pages 349-350, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2004.06.006.
(http://www.sciencedirect.com/science/article/B6TFD-4CTN4S6-3/2/840f757295339948c8a94253edab03a5)

S. Al-Asheh, R. Jumah, F. Banat, K. Al-Zou'Bi, Direct Current Electroosmosis Dewatering of Tomato Paste Suspension, Food and Bioproducts Processing, Volume 82, Issue 3, September 2004, Pages 193-200, ISSN 0960-3085, DOI: 10.1205/fbio.82.3.193.44179.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVN8-3/2/7e671c99ccbcd603b454b25af68e803e)
Abstract:
Removal of water from food suspensions is of great interest in food technology. Among these suspensions is tomato paste. Direct current electroosmosis dewatering technique was used to concentrate tomato paste suspension. The apparatus was designed for this objective. The tomato paste suspension was prepared at a certain concentration, held between two electrodes in a vertical mode and direct electrical field (DC) applied to the suspension bed. The effects of voltage, current, bed height, pH and initial solid concentration were examined, in terms of water flux per unit charge and energy of dewatering. Significant amounts of water were removed by electroosmosis dewatering process under the operating conditions of the experiments used in this work. The process saved 70% of energy compared with that necessary to vaporize the same amount of water.
Keywords: tomato paste; electroosmosis; dewatering; direct current

Carmen G. Boeriu, Dominique Bravo, Richard J. A. Gosselink, Jan E. G. van Dam, Characterisation of structure-dependent functional properties of lignin with infrared spectroscopy, Industrial Crops and Products, Volume 20, Issue 2, 6th International Lignin Institute conference, September 2004, Pages 205-218, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2004.04.022.
(http://www.sciencedirect.com/science/article/B6T77-4CPM5Y2-1/2/4468371740eb228b4ea6d52398bd6f01)
Abstract:
Fourier-transformed infrared spectroscopy (FT-IR) was evaluated as an analytical technique for the estimation of the chemical composition and functional properties of lignin. A sample set containing various non-wood, hardwood and softwood lignins isolated by different processing technologies was used. The lignin samples were characterised by both conventional chemical analysis and non-destructive methods, such as diffuse reflectance FT-IR. Principal component

analysis (PCA) based on the IR-fingerprint spectral region allowed classification of lignins according to origin and processing conditions.
The antioxidative properties of each lignin sample in both aqueous and micellar systems were determined. All lignin samples showed radical scavenging activity, with sisal and abaca lignin being the most effective radical scavengers. The radical scavenging efficiency of the most efficient lignin was about 20% of that of BHT and tocopherol (based on weight), compounds that are commonly used in food and cosmetic industries.
Multivariate analysis was applied to correlate chemical composition and antioxidative properties of lignins with the FT-IR spectral data. Partial least squares (PLS) models were able to predict the major components' concentrations and radical scavenging activity at the 99% confidence level presenting r2 values higher than 0.80 in most cases.
Keywords: Lignin characterisation; FT-IR; Antioxidant; Multivariate analysis; Structure-function relationship

V. M. Balasubramaniam, E. Y. Ting, C. M. Stewart, J. A. Robbins, Recommended laboratory practices for conducting high-pressure microbial inactivation experiments, Innovative Food Science & Emerging Technologies, Volume 5, Issue 3, September 2004, Pages 299-306, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.04.001.
(http://www.sciencedirect.com/science/article/B6W6D-4CJVR35-1/2/677606adb68303a23fc63ada33dbecec)
Abstract:
This paper highlights some of the common problems and pitfalls that may be encountered by a researcher conducting high-pressure microbial inactivation studies. One of the unique advantages of high-pressure food processing in comparison to thermal processing is that pressure acts uniformly and instantaneously throughout the mass of the food. On the other hand, increase in sample temperature, due to pressurization, can lead to process non-uniformity issues during high-pressure processing (HHP). Differences in equipment heat transfer characteristics and inadequate reporting of experimental methodologies may hinder independent verification of results between laboratories. Knowledge of thermal history and controlling thermal effects is critical for conducting high-pressure microbial inactivation studies. Approaches that may aid in meaningful comparison of results obtained among various laboratories are provided.
Keywords: High-pressure processing; Thermal effects; Microbial inactivation

S. J. C. M. Oomes, S. Brul, The effect of metal ions commonly present in food on gene expression of sporulating Bacillus subtilis cells in relation to spore wet heat resistance, Innovative Food Science & Emerging Technologies, Volume 5, Issue 3, September 2004, Pages 307-316, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.03.006.
(http://www.sciencedirect.com/science/article/B6W6D-4CNPJHG-1/2/9509a1b72fb08bebc5e17c217a5129b3)
Abstract:
Bacillus subtilis is a food spoilage spore-forming bacterium. The spores can be very heat-resistant and may cause problems in the production of foods. Varying the metal concentration in the sporulation media is known to influence the heat resistance of the spores. The effect of changing the metal composition of the sporulation media was monitored by means of transcriptome analysis. Heat resistance was measured based on the method described by Kooiman and the transcriptome analysis was performed with micro-arrays of B. subtilis wt168 DNA. The micro-array analysis showed that genes coding for the two small acid soluble proteins (SASPs a and b) were induced earlier during sporulation in the media that contained higher metal concentrations and produced thermal-resistant spores. The results also showed that the spores of a product isolate (strain B. subtilis A163) were much more heat-resistant than the spores produced under the same

environmental conditions by strain B. subtilis PS832. In addition to other genes, SASP a was also significantly induced in cells of strain B. subtilis A163 at early to middle stages of sporulation.
Keywords: Heat resistance; Micro-array; B. subtilis; Ionisation; SASPs

Lihan Huang, Infrared surface pasteurization of Turkey frankfurters, Innovative Food Science & Emerging Technologies, Volume 5, Issue 3, September 2004, Pages 345-351, ISSN 1466-8564, DOI: 10.1016/j.ifset.2004.03.007.
(http://www.sciencedirect.com/science/article/B6W6D-4CJV7GB-1/2/7eca4a929fbc143b0f1278466c7fcfec)
Abstract:
A new intervention method has been developed using infrared heating to pasteurize the surface of turkey frankfurters contaminated with potentially fatal Listeria monocytogenes prior to final packaging. A laboratory infrared heating device was constructed to treat turkey frankfurters coated with approximately 106-7 cells/cm2 of a four-strain mixture of freshly prepared L. monocytogenes. The surface temperature of frankfurters was increased from refrigerated conditions to a final temperature of 70, 75 and 80 [degree sign]C, achieving an average of 3.5+/-0.4, 4.3+/-0.4 and 4.5+/-0.2 (mean+/-S.E.) log-reductions in bacterial counts. No noticeable physical damage to the heat-treated samples was observed. Although the heat-treated samples were slightly browner than the control by visual observation, the measured color attributes (L*, a* and b*) were not significantly different from the control after a few hours of refrigerated storage. Experimental results of this study suggested that infrared surface pasteurization potentially could be use as an intervention technology to kill L. monocytogenes contaminated on the surface of frankfurters immediately prior to final packaging and reduce the risk of foodborne listeriosis caused by these products.
Keywords: Infrared heating; Frankfurters; Surface pasteurization; Cooked meat; Listeria monocytogenes

Samantha Hu Liming, Arvind A Bhagwat, Application of a molecular beacon--real-time PCR technology to detect Salmonella species contaminating fruits and vegetables, International Journal of Food Microbiology, Volume 95, Issue 2, 1 September 2004, Pages 177-187, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2004.02.013.
(http://www.sciencedirect.com/science/article/B6T7K-4C70B1S-2/2/92b69c27fae65aa75aec8dcfe1aa323b)
Abstract:
An oligonucleotide probe that becomes fluorescent upon hybridization to the target DNA (molecular beacon; MB) was evaluated in a real-time polymerase chain reaction (PCR) assay to detect the presence of Salmonella species. As few as 1-4 colony-forming units (CFU) per PCR reaction could be detected. The capability of the assay to detect Salmonella species from artificially inoculated fresh-cut produce such as cantaloupe, mixed-salad, cilantro, and alfalfa sprouts was demonstrated. A comparison of two commercially available kits utilizing MB-PCR (iQ-Check, Bio-Rad Laboratories) and conventional Association of Official Analytical Chemists (AOAC)-approved PCR (BAX, Dupont Qualicon) was performed on artificially inoculated produce. As few as 4 CFU/25 g of produce were detected after 16 h of enrichment in buffered peptone broth. These assays could be carried out entirely in sealed PCR tubes, enabling a rapid and high-throughput detection of Salmonella species in a large number of food and environmental samples. This is the first report of the application of MB probe being used for real-time detection of Salmonella species in whole and fresh-cut fruits and vegetables.
Keywords: Microbial food safety; Ready-to-eat produce; Foodborne pathogens

Chaiwat Bandaiphet, John F. Kennedy, Food Technology and Quality Evaluation: R. Dris, A. Sharma (Eds.); Science Publishers, Inc., Enfield, NH, USA, 2003, x+273 pp., Price US$94.00,

ISBN 1-57808-235-8, Carbohydrate Polymers, Volume 57, Issue 1, 12 August 2004, Page 102, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2004.04.004.
(http://www.sciencedirect.com/science/article/B6TFD-4CCF9J6-1/2/062be4d3a59b7aa6b33cb65348f497fe)

D. N. Cox, A. Koster, C. G. Russell, Predicting intentions to consume functional foods and supplements to offset memory loss using an adaptation of protection motivation theory, Appetite, Volume 43, Issue 1, August 2004, Pages 55-64, ISSN 0195-6663, DOI: 10.1016/j.appet.2004.02.003.
(http://www.sciencedirect.com/science/article/B6WB2-4C5PTGY-2/2/7296b8a949d2dededf35f3644a44e5bd)
Abstract:
The widespread use of dietary supplements and so-called `functional foods' is thought to be partially motivated by self-control of health. However, whilst consumers want foods associated with well-being or disease prevention, they are unlikely to be willing to compromise on taste or technology. This presents a dilemma for promoters of functional foods.
Middle-aged consumers' intentions to consume functional foods or supplements that may improve memory were tested within an adaptation of Protection Motivation theory (PMT). Participants evaluated text descriptions of four products described as: having an unpleasant bitter taste (Natural-FF); having `additives' to reduce bitterness (Sweetened-FF); being genetically modified to enhance function (GM-FF) and Supplements. Participants were recruited as being of high and low perceived vulnerability to memory failure. In total, 290 middle-aged consumers (aged 40-60 years) participated in the study.
Motivations to consume the GM-FF were the lowest. There were gender differences between intention to consume the supplements, Natural-FF and Sweetened-FF and product differences within genders. Women were less favourable than men in their attitudes towards genetic modification in general. Regression analyses indicated that PM predictors of intention to consume functional foods or supplements explained 59-63% of the variance (R2). Overall, perceived `efficacy' (of the behaviour) and self-efficacy were the most important predictors of intentions to consume.
Keywords: Attitudes; Neutraceuticals; Health; Functional foods; Supplements; Memory; Protection motivation theory; Consumers

A. Backstrom, A. -M. Pirttila-Backman, H. Tuorila, Willingness to try new foods as predicted by social representations and attitude and trait scales, Appetite, Volume 43, Issue 1, August 2004, Pages 75-83, ISSN 0195-6663, DOI: 10.1016/j.appet.2004.03.004.
(http://www.sciencedirect.com/science/article/B6WB2-4CDS0PS-2/2/c5b09bf162e1b49da7069838cebdf28d)
Abstract:
The structure and predictive ability of social representation of new foods were investigated and compared with instruments measuring relevant attitudes and traits using a questionnaire quantifying these aspects, completed by 743 respondents. Based on their rated willingness to try, new foods were categorized as modified dairy products, genetically modified (GM), organic, and ethnic products (two examples, snails and passion fruit, were treated separately). The social representation (SR) consisted of five dimensions: suspicion of novelties, adherence to technology, adherence to natural food, eating as an enjoyment, and eating as a necessity. The SR dimensions were strong predictors of willingness to try GM foods (predicted by adherence to technology) and organic foods (predicted by adherence to natural foods). Low food neophobia predicted the rated willingness to try snails and passion fruit. Thus, different constructs predicted willingness to try different categories of new foods, and as a whole, SR dimensions markedly improved the prediction.

Keywords: New foods; Social representations

N. Benkerroum, A. Y. Tamime, Technology transfer of some Moroccan traditional dairy products (lben, jben and smen) to small industrial scale, Food Microbiology, Volume 21, Issue 4, August 2004, Pages 399-413, ISSN 0740-0020, DOI: 10.1016/j.fm.2003.08.006.
(http://www.sciencedirect.com/science/article/B6WFP-4BWVTF1-2/2/8919a55179cf4c12fd5c9440ed5ef92e)
Abstract:
Moroccan traditional dairy products, especially the fermented types, have been the pride of culinary tradition for centuries. It is evident that these products have played a major role in the diet of communities in the rural region. Among those, lben, smen and jben are the most common and are being increasingly marketed throughout the country in informal ways. They should be produced and their chemical composition should be adapted to the international economic environment and in compliance with food safety requirements. Traditional methods of manufacture should take advantage of technical progress to assure a reasonable margin of benefit, and at the same time conserve the authenticity and origin(s) of these products. The requirements for an adequate and sustainable technology transfer of three traditional Moroccan fermented dairy products (i.e. lben, jben and smen) are discussed in the scope of the transfer of these products' technologies to small and/or medium industrial scale. Schemes to standardize the manufacturing stages of lben, smen and jben making are proposed. Emphasis is put on the relevance of the role of the starter cultures as the missing part in the traditional methods of manufacture to ascertain appropriate transfer with respect to the maintenance of sensory profiling, nutritional quality and physical properties of the original products. Relevant research and development activities are suggested; regulatory aspects to define objectively the quality criteria and to protect the authenticity of the product are also discussed.
Keywords: Traditional dairy fermentation; lben; jben; smen; Chemical composition; Microbiology; Technology transfer; Small-scale industry; Starter culture

Stein Holden, Bekele Shiferaw, John Pender, Non-farm income, household welfare, and sustainable land management in a less-favoured area in the Ethiopian highlands, Food Policy, Volume 29, Issue 4, Less Favoured Areas, August 2004, Pages 369-392, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2004.07.007.
(http://www.sciencedirect.com/science/article/B6VCB-4DD8HBY-2/2/e9632419096b0d0b5bcdbf6cdcc7c2d6)
Abstract:
A bio-economic model has been calibrated to the socio-economic and biophysical characteristics of a less-favoured area in the Ethiopian highlands. Land degradation, population growth, stagnant technology, and drought necessitates development of non-farm employment opportunities in the area. The model has been used to assess the impact of improved access to non-farm income on household welfare, agricultural production, conservation investments and land degradation in form of soil erosion.
The model simulations indicate that access to low-wage off-farm income is restricted by lack of employment opportunities since households otherwise would have engaged in more off-farm wage employment than observed. The simulations show that better (unconstrained) access to low-wage non-farm income has a substantial positive effect on household income. Total agricultural production (crop and livestock production) and farm inputs used are reduced when access to non-farm employment is improved and thus increases the need to import food to the area. Access to non-farm income reduces farm households' incentives to invest in conservation and this leads to more overall soil erosion and more rapid land degradation even though intensity of production is reduced. Special policies are therefore needed to ensure land conservation and to sustain local food production.

Keywords: Nonfarm income; Market imperfections; Bioeconomic model; Ethiopia

M. E. van der Veen, A. J. van der Goot, C. A. Vriezinga, J. W. G. De Meester, R. M. Boom, On the potential of uneven heating in heterogeneous food media with dielectric heating, Journal of Food Engineering, Volume 63, Issue 4, August 2004, Pages 403-412, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2003.08.011.
(http://www.sciencedirect.com/science/article/B6T8J-49JX8MJ-2/2/b9de1e991f1fbfb68ef901e4c63a4701)
Abstract:
A dynamic model was developed describing dielectric heating dynamics of a heterogeneous material, in which the dispersed phase heats more quickly than the surrounding phase. The model includes effects of scattering by small particles, absorption and differences in thermal and conduction properties, as well as domain size.
The model shows that the smallest domain sizes that can be heated selectively are determined by dielectric and thermal properties of both domains and the applied field strength. In the case of food products, it can be concluded that the minimal size at which significant temperature differences can occur is about 1 mm applying current available microwave technology.
However, in the case of pulsed fields, the domains that can be heated selectively can be orders of magnitude smaller than with constant fields, without requiring higher overall energy inputs.
Keywords: Microwave; Dielectric heating; Uneven heating; Selective heating; Preservation; Heterogeneous foods

J. Carlos Popelka, Nancy Terryn, T. J. V. Higgins, Gene technology for grain legumes: can it contribute to the food challenge in developing countries?, Plant Science, Volume 167, Issue 2, August 2004, Pages 195-206, ISSN 0168-9452, DOI: 10.1016/j.plantsci.2004.03.027.
(http://www.sciencedirect.com/science/article/B6TBH-4CBVMD9-1/2/a8cc8fb5b538f2848eede6e1df0ba5e2)
Abstract:
Grain legumes play a crucial role in the sustainability of agricultural systems and in food protein supply in developing countries. Several constraints that limit crop production or quality have been addressed by conventional breeding and enhanced management, but there are situations where the existing germplasm lacks the required traits. Genetic transformation could help provide solutions to certain constraints, thus improving food security in developing countries. The potential benefits of this form of genetic improvement have not yet been realised, mainly because efficient and reproducible gene transfer systems are not available. We review the state of the art of gene technology for genetic improvement of those grain legumes of major importance to developing countries. Protocols are evaluated for their reproducibility, efficiency and robustness.
Keywords: Grain legumes; Pulses; Developing countries; Genetic transformation; Food security

Olga Diaz, Carlos D. Pereira, Angel Cobos, Functional properties of ovine whey protein concentrates produced by membrane technology after clarification of cheese manufacture by-products, Food Hydrocolloids, Volume 18, Issue 4, July 2004, Pages 601-610, ISSN 0268-005X, DOI: 10.1016/j.foodhyd.2003.10.003.
(http://www.sciencedirect.com/science/article/B6VP9-4B4S6SG-1/2/130c05e86fe8a610e6ed4f3a0feca1ec)
Abstract:
Functionality (solubility, emulsifying and foaming properties) of ovine cheese whey and deproteinized whey (Sorelho) protein concentrates was evaluated. Both by-products of ovine cheese manufacture were clarified by thermocalcic precipitation and microfiltration using two pore size membranes (0.65 and 0.20 [mu]m). Next, they were ultrafiltrated/diafiltrated, and then, the liophilization of the corresponding retentates was carried out. The functionality of these powders,

as well as that of untreated ultrafiltrated whey protein concentrate (WPC) and microfiltration retentates powders, was evaluated.
The clarification treatment increased solubility of the WPC produced from ovine whey and deproteinized ovine whey. Moreover, these products had foaming properties, whereas conventional WPC and microfiltration retentate powders (MFRP) were unable to produce foams. The whey product obtained after clarification using a 0.65 [mu]m microfiltration membrane had the best foaming properties. The clarification treatment did not significantly increase emulsifying activity and stability, except for the Sorelho product obtained using a 0.65 [mu]m membrane.
MFRP from ovine whey and Sorelho, the by-products of the clarification procedure, showed similar solubility and higher emulsifying activity than conventional WPC, although their emulsion stability was lower.
The clarification procedure studied, particularly when a 0.65 [mu]m microfiltration membrane was used, improved some functional properties of the whey and Sorelho protein concentrates, and also generated microfiltration retentates for potential use in food manufacturing.
Keywords: Functional properties; Ovine cheese whey; Deproteinized whey; Whey clarification; Microfiltration

F. Cellini, A. Chesson, I. Colquhoun, A. Constable, H. V. Davies, K. H. Engel, A. M. R. Gatehouse, S. Karenlampi, E. J. Kok, J. -J. Leguay, S. Lehesranta, H. P. J. M. Noteborn, J. Pedersen, M. Smith, Unintended effects and their detection in genetically modified crops, Food and Chemical Toxicology, Volume 42, Issue 7, Safety Assessment, Detection and Traceability, and Societal Aspects of Genetically Modified Foods European Network on Safety Assessment of Genetically Modified Food Crops (ENTRANSFOOD), July 2004, Pages 1089-1125, ISSN 0278-6915, DOI: 10.1016/j.fct.2004.02.003.
(http://www.sciencedirect.com/science/article/B6T6P-4C004D3-3/2/aa7645e0537a1179bdf1f50aa4c376b3)
Abstract:
The commercialisation of GM crops in Europe is practically non-existent at the present time. The European Commission has instigated changes to the regulatory process to address the concerns of consumers and member states and to pave the way for removing the current moratorium. With regard to the safety of GM crops and products, the current risk assessment process pays particular attention to potential adverse effects on human and animal health and the environment. This document deals with the concept of unintended effects in GM crops and products, i.e. effects that go beyond that of the original modification and that might impact primarily on health. The document first deals with the potential for unintended effects caused by the processes of transgene insertion (DNA rearrangements) and makes comparisons with genetic recombination events and DNA rearrangements in traditional breeding. The document then focuses on the potential value of evolving 'profiling' or 'omics' technologies as non-targeted, unbiased approaches, to detect unintended effects. These technologies include metabolomics (parallel analysis of a range of primary and secondary metabolites), proteomics (analysis of polypeptide complement) and transcriptomics (parallel analysis of gene expression). The technologies are described, together with their current limitations. Importantly, the significance of unintended effects on consumer health are discussed and conclusions and recommendations presented on the various approaches outlined.
Keywords: Genetic modification; Substantial equivalence; Comparative analysis; Targeted analysis; Non-targeted analysis; Unpredictable effects; Unexpected effects

G. van den Eede, H. Aarts, H. -J. Buhk, G. Corthier, H. J. Flint, W. Hammes, B. Jacobsen, T. Midtvedt, J. van der Vossen, A. von Wright, W. Wackernagel, A. Wilcks, The relevance of gene transfer to the safety of food and feed derived from genetically modified (GM) plants, Food and Chemical Toxicology, Volume 42, Issue 7, Safety Assessment, Detection and Traceability, and

Societal Aspects of Genetically Modified Foods European Network on Safety Assessment of Genetically Modified Food Crops (ENTRANSFOOD), July 2004, Pages 1127-1156, ISSN 0278-6915, DOI: 10.1016/j.fct.2004.02.001.
(http://www.sciencedirect.com/science/article/B6T6P-4C4W1PK-1/2/4da07d18fca9ddcd45de12bb24c8d825)
Abstract:
In 2000, the thematic network ENTRANSFOOD was launched to assess four different topics that are all related to the testing or assessment of food containing or produced from genetically modified organisms (GMOs). Each of the topics was linked to a European Commission (EC)-funded large shared cost action (see http://www.entransfood.com). Since the exchange of genetic information through horizontal (lateral) gene transfer (HGT) might play a more important role, in quantity and quality, than hitherto imagined, a working group dealing with HGT in the context of food and feed safety was established. This working group was linked to the GMOBILITY project (GMOBILITY, 2003) and the results of the deliberations are laid down in this review paper. HGT is reviewed in relation to the potential risks of consuming food or feed derived from transgenic crops. First, the mechanisms for obtaining transgenic crops are described. Next, HGT mechanisms and its possible evolutionary role are described. The use of marker genes is presented in detail as a special case for genes that may pose a risk. Furthermore, the exposure to GMOs and in particular to genetically modified (GM) deoxyribonucleic acid (DNA) is discussed as part of the total risk assessment. The review finishes off with a number of conclusions related to GM food and feed safety. The aim of this paper is to provide a comprehensive overview to assist risk assessors as well as regulators and the general public in understanding the safety issues related to these mechanisms.
Keywords: Aantibiotic resistance; Marker genes; Marker gene removal; Biosafety; Transformation; Conjugation; Agrobacterium tumefaciens; risk assessment; safety assessment; DNA degradation; DNA integration; Horizontal gene transfer; Marker rescue; GMO; Gene transfer; DNA stability; Transgenic crop plants; Recombinant DNA; Dietary intake; Food safety; Intestinal microflora; Antibiotic resistance markers; DNA in food; DNA in feed

L. Frewer, J. Lassen, B. Kettlitz, J. Scholderer, V. Beekman, K. G. Berdal, Societal aspects of genetically modified foods, Food and Chemical Toxicology, Volume 42, Issue 7, Safety Assessment, Detection and Traceability, and Societal Aspects of Genetically Modified Foods European Network on Safety Assessment of Genetically Modified Food Crops (ENTRANSFOOD), July 2004, Pages 1181-1193, ISSN 0278-6915, DOI: 10.1016/j.fct.2004.02.002.
(http://www.sciencedirect.com/science/article/B6T6P-4C8NH9R-1/2/b0385f9b4d538e41a81f325881282d78)
Abstract:
This paper aims to examine some of the reasons behind public controversy associated with the introduction of genetically modified foods in Europe the 1990s. The historical background to the controversy is provided to give context. The issue of public acceptance of genetically modified foods, and indeed the emerging biosciences more generally, is considered in the context of risk perceptions and attitudes, public trust in regulatory institutions, scientists, and industry, and the need to develop communication strategies that explicitly include public concerns rather than exclude them. Increased public participation has been promoted as a way of increasing trust in institutional practices associated with the biosciences, although questions still arise as to how to best utilise the outputs of such exercises in policy development. This issue will become more of a priority as decision-making systems become more transparent and open to public scrutiny. The results are discussed in the context of risk assessment and risk management, and recommendations for future research are made. In particular, it is recommended that new methods are developed in order to integrate public values more efficaciously into risk analysis processes, specifically with respect to the biosciences and to technology implementation in general.

Keywords: Consumers; Risk perception; Technology acceptance; Regulation; Public engagement

H. A. Kuiper, A. Konig, G. A. Kleter, W. P. Hammes, I. Knudsen, Concluding remarks, Food and Chemical Toxicology, Volume 42, Issue 7, Safety Assessment, Detection and Traceability, and Societal Aspects of Genetically Modified Foods European Network on Safety Assessment of Genetically Modified Food Crops (ENTRANSFOOD), July 2004, Pages 1195-1202, ISSN 0278-6915, DOI: 10.1016/j.fct.2004.02.004.
(http://www.sciencedirect.com/science/article/B6T6P-4C004D3-2/2/80e80dd361e0a708a9de839e7f537781)
Abstract:
The most important results from the EU-sponsored ENTRANSFOOD Thematic Network project are reviewed, including the design of a detailed step-wise procedure for the risk assessment of foods derived from genetically modified crops based on the latest scientific developments, evaluation of topical risk assessment issues, and the formulation of proposals for improved risk management and public involvement in the risk analysis process.
Keywords: Food; Plant biotechnology; Genetic modification; Genetic engineering; Genetic manipulation; Transgenic crops; Novel foods; Regulation; Safety assessment; Risk analysis; Toxicology; Allergy, substantial equivalence; Unintended effects; Post market monitoring; Compositional analysis; Advanced analytical methods; Profiling; Horizontal gene transfer; Antibiotic resistance marker genes; Detection; Traceability; Consumer issues; Public participation

A. A. Koutinas, R. Wang, C. Webb, Evaluation of wheat as generic feedstock for chemical production, Industrial Crops and Products, Volume 20, Issue 1, 5th European Symposium on Industrial Crops and Products and the 3rd International Congress and Trade Show GreenTech 2002, July 2004, Pages 75-88, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2003.12.013.
(http://www.sciencedirect.com/science/article/B6T77-4BT1DYD-3/2/142cdbbc119a0f180f39a9f7b1587aa3)
Abstract:
Biotechnology may have grown remarkably in the past 10 years but one of the reasons that restrains its dominance over chemical processing is the type of raw materials that are used. Price is the major barrier to development. European prices of fermentation feedstocks are not competitive in comparison with world market prices and fossil fuel sources of carbon. In addition, the need for cheap and efficient raw materials for bioprocessing is increasing rapidly and the carbohydrate extraction industry (starch and sugar) is unable to meet such requirements because it is largely based on old technology with high-energy requirements. Furthermore, the major consumer of the carbohydrate extraction industry is the food sector, which diminishes the outlets for bioprocessing. A solution to this problem can be achieved by developing a generic feedstock from agricultural products/by-products, which will provide high efficiency in conjunction with profitability. The production of such a generic feedstock from renewable raw materials, such as dedicated feedstock crops (silviculture or short-rotation tree crops), conventional food crops (cereals) and waste by-products derived from industry, has stimulated extensive international interest among scientific communities.
In this study, wheat has been evaluated, including preliminary critical review and economic analysis, as a generic feedstock for chemical production. Initially, the world wheat production was evaluated for the production of major bioproducts, such as bioethanol, amino acids and organic acids, and various bulk commodity chemicals, such as ethylene, propylene, butadiene and their derivatives. This theoretical work showed that a two-fold increase of the world wheat reserves could lead to the production of many chemical products via bioprocessing without any reduction in the food outlets of wheat. The economic analysis demonstrated that wheat could compete with conventional fermentation feedstocks, such as sugar and starch derivatives, in terms of profitability.

Keywords: Bioprocessing; Wheat; Chemical production; Economic evaluation

Sebastien Gouin, Microencapsulation: industrial appraisal of existing technologies and trends, Trends in Food Science & Technology, Volume 15, Issues 7-8, NFIF part 2, July-August 2004, Pages 330-347, ISSN 0924-2244, DOI: 10.1016/j.tifs.2003.10.005.
(http://www.sciencedirect.com/science/article/B6VHY-4BHJX55-1/2/05912596d47e057f398fef81f50fc7f0)
Abstract:
Controlled release of food ingredients at the right place and the right time is a key functionality that can be provided by microencapsulation. A timely and targeted release improves the effectiveness of food additives, broadens the application range of food ingredients and ensures optimal dosage, thereby improving cost-effectiveness for the food manufacturer. Reactive, sensitive or volatile additives (vitamins, cultures, flavors, etc.) can be turned into stable ingredients through microencapsulation. With carefully fine-tuned controlled release properties, microencapsulation is no longer just an added value technique, but the source of totally new ingredients with matchless properties.

Svetlana Rodgers, Novel approaches in controlling safety of cook-chill meals, Trends in Food Science & Technology, Volume 15, Issues 7-8, NFIF part 2, July-August 2004, Pages 366-372, ISSN 0924-2244, DOI: 10.1016/j.tifs.2003.11.005.
(http://www.sciencedirect.com/science/article/B6VHY-4BYRT2T-1/2/e077ec21c7f92d3265c2d3bcfec098fd)
Abstract:
There are limited choices of `fresh' technologies suitable for LSL (long shelf life) cook-chill meals. Preservation with PCs (protective cultures) provides the unique temperature-responsive protection. Bacteriocin production and the reduction in pH constitute the PCs inhibiting mechanism. The process leading to PC application includes the selection of suitable strains, confirmation of antibiosis in a microbiological medium as well as food systems. It was recommended that further studies address the fundamentals of inhibition mechanism and the applied aspects of the application such as the ways of a PC introduction into foods.

Donald W. Larson, Eugene Jones, R. S. Pannu, R. S. Sheokand, Instability in Indian agriculture--a challenge to the Green Revolution technology, Food Policy, Volume 29, Issue 3, June 2004, Pages 257-273, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2004.05.001.
(http://www.sciencedirect.com/science/article/B6VCB-4CSYMTY-1/2/9083175fa6df920a9ebb9f4b258815f9)
Abstract:
The Green Revolution technology succeeded in transforming India from a large food importer and large recipient of food aid in the 1950s and 1960s, to a food secure country. Indeed, during periods of the 1980s and 1990s, India could occasionally export food. However, the Green Revolution technology may not have reduced the instability of agriculture during the last two decades. This paper examines the factors responsible for instability in area, yield and production for major crops in India from 1950-1951 to 2001-2002. This period is divided into a pre-Green Revolution and post-Green Revolution, with each period analyzed separately as well as jointly. Further, a similar analysis is done for rice yields for the top five producing states. The results show that the sources of growth of crop production have been achieved primarily from yield increases, especially since the introduction of the Green Revolution technology. Area cultivated did expand, but this expansion was not rapid enough to generate the realized production changes. Results for the Green Revolution technology impact on instability are somewhat mixed. The purest measure of crop instability, coefficient of variation, shows a decrease in production instability for wheat, total cereals, sugarcane, and total pulses for all of India. The remaining 10 crops and crop groups show

an increase in production instability. Measures of dispersion for crop instability show similar results, but the interpretation of these results is less transparent because these measures involve covariances between area and yields and other interactions effects. Overall, many of the problems associated with production instability continue to persist, and the challenge to find increased stability continues.
Keywords: Green Revolution; India; Instability

G. Roudaut, D. Simatos, D. Champion, E. Contreras-Lopez, M. Le Meste, Molecular mobility around the glass transition temperature: a mini review, Innovative Food Science & Emerging Technologies, Volume 5, Issue 2, June 2004, Pages 127-134, ISSN 1466-8564, DOI: 10.1016/j.ifset.2003.12.003.
(http://www.sciencedirect.com/science/article/B6W6D-4BX77S6-1/2/09a2dbb05eba9affe768d2508f3c5dc4)
Abstract:
This paper consists of a non-exhaustive review of molecular mobility in relation to the glass transition, based on both synthetic polymer and food science literature. The glass transition phenomenon is a concept originally developed for synthetic polymers, which has been applied to many food products particularly with a view to predict their stability over time or temperature or water content. The glass transition is considered to be the point at which the material changes from having a solid-like behaviour to a more malleable or liquid-like. This paper proposes an assessment of the different levels of mobility existing below and above the glass transition temperature, with some examples of their consequences on the physical properties of the products.
Keywords: Glass transition; Mobility; Relaxation; Diffusion; Food; Stability

Denis Hemme, Catherine Foucaud-Scheunemann, Leuconostoc, characteristics, use in dairy technology and prospects in functional foods, International Dairy Journal, Volume 14, Issue 6, June 2004, Pages 467-494, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2003.10.005.
(http://www.sciencedirect.com/science/article/B6T7C-4B6CPB0-1/2/e456ef3655c3034a26a9a6d8cb78deb8)
Abstract:
This review presents up to date comprehensive data about Leuconostoc, relative to their habitat, taxonomy, metabolism, and genetics, their implications in health and safety, and their present and potential use in dairy technology and functional foods.
Keywords: Leuconostoc; Review; Cheese; Dairy products; Habitat; Classification; Taxonomy; Bacteriophages; Technology; Bacteriocins; Metabolism; Plasmids; Genetics; Polysaccharides; Clinical occurrence; Infection

Judy Cunningham, Luisa Trevisan, Gregory Milligan, Lessons learned from providing a free nutrition labelling tool for industry--the Australian experience, Journal of Food Composition and Analysis, Volume 17, Issues 3-4, Papers from the Joint Meeting of the 5th International Food Data Conference and the 27th US National Nutrient Databank Conference, June-August 2004, Pages 565-574, ISSN 0889-1575, DOI: 10.1016/j.jfca.2004.03.004.
(http://www.sciencedirect.com/science/article/B6WJH-4CG7FR0-12/2/4811f11a414d112a753342abcd81d5e2)
Abstract:
Food Standards Australia New Zealand (FSANZ) establishes a common set of food standards for use in two countries--Australia and New Zealand. These standards require, among other provisions, that almost all packaged foods carry a nutrition information panel containing information on the levels of energy, protein, fat, saturated fat, carbohydrate, sugars and sodium in 100 g and in a serving of the food. In 2001, FSANZ developed a free, web-based nutrition labelling

tool to assist manufacturers to meet these nutrition labelling requirements. A customized database, containing nutrient information on consumer-ready foods, food additives and specialized food ingredients, was developed based on Australian national food composition tables. Detailed explanatory notes were prepared. After 18 months of operation, we have identified a number of areas where unforeseen issues have arisen: the difficulty of including reliable, representative data for specialized food ingredients; inadequate information technology infrastructure among users; lack of user knowledge about nutrients and foods; weak literacy and mathematical skills among some users; heavy demand for assistance from FSANZ staff; and the need to consider aspects of legal liability. The lessons learned by FSANZ in providing this labelling tool are relevant for other national food composition programs.
Keywords: Nutrition labelling; Food composition data; Internet

Daniel E. Lieberman, Gail E. Krovitz, Franklin W. Yates, Maureen Devlin, Marisa St. Claire, Effects of food processing on masticatory strain and craniofacial growth in a retrognathic face, Journal of Human Evolution, Volume 46, Issue 6, June 2004, Pages 655-677, ISSN 0047-2484, DOI: 10.1016/j.jhevol.2004.03.005.
(http://www.sciencedirect.com/science/article/B6WJS-4CG0R52-2/2/a5f7b22b6b95bea9d2b241447ed7f406)
Abstract:
Changes in the technology of food preparation over the last few thousand years (especially cooking, softening, and grinding) are hypothesized to have contributed to smaller facial size in humans because of less growth in response to strains generated by chewing softer, more processed food. While there is considerable comparative evidence to support this idea, most experimental tests of this hypothesis have been on non-human primates or other very prognathic mammals (rodents, swine) raised on hard versus very soft (nearly liquid) diets. Here, we examine facial growth and in vivo strains generated in response to raw/dried foods versus cooked foods in a retrognathic mammal, the rock hyrax (Procavia capensis). The results indicate that the hyrax cranium resembles the non-human primate cranium in having a steep gradient of strains from the occlusal to orbital regions, but differs from most non-anthropoids in being primarily twisted; the hyrax mandible is bent both vertically and laterally. In general, higher strains, as much as two-fold at some sites, are generated by masticating raw versus cooked food. Hyraxes raised on cooked food had significantly less growth (approximately 10%) in the ventral (inferior) and posterior portions of the face, where strains are highest, resembling many of the differences evident between humans raised on highly processed versus less processed diets. The results support the hypothesis that food processing techniques have led to decreased facial growth in the mandibular and maxillary arches in recent human populations.
Keywords: Hyrax; Skull growth; Mandible; Maxilla; Cooking; Mastication; Strain

Niels Skovgaard, Food Processing Technology. Principles and Practice: P.J. Fellows, CRC, Woodhead Publishing, Cambridge, England, 2002; xxxi+575 pages, soft cover; Woodhead Publishing, ISBN 1 85573 533 4, CRC Press, ISBN 0-8493-0887-9, order no. WP0887; UK [pound sign]35.00/US $55.00/[euro]55.00, sales@woodhead-publishing.com, International Journal of Food Microbiology, Volume 93, Issue 1, 15 May 2004, Page 124, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2003.11.002.
(http://www.sciencedirect.com/science/article/B6T7K-4BNMK4D-3/2/437b19c29eca292a6549e0369d564de7)

M. S. Venkatesh, G. S. V. Raghavan, An Overview of Microwave Processing and Dielectric Properties of Agri-food Materials, Biosystems Engineering, Volume 88, Issue 1, May 2004, Pages 1-18, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2004.01.007.

(http://www.sciencedirect.com/science/article/B6WXV-4C2NJJ7-1/2/d18dccc7e59856160ddc5ad99af24a08)
Abstract:
Microwave measurements and the dielectric properties of materials are finding increasing application, as new electro-technology is adapted for use in agriculture and food processing industries. The interest in dielectric properties of materials has historically been associated with the design of electrical equipment, where various dielectrics are used for insulating conductors and other components of electric equipment. Although direct heating by microwaves can offer advantages over conventional heat transfer, the different mechanism of energy transfer in microwave heating has led to new processing challenges. This paper is the outcome of an extensive and comprehensive literature review in the area and mainly summarises several microwave processing aspects and its usefulness in understanding the microwave-material interaction and the role of dielectric properties.

Gerhard Schiefer, New technologies and their impact on the agri-food sector: an economists view, Computers and Electronics in Agriculture, Volume 43, Issue 2, May 2004, Pages 163-172, ISSN 0168-1699, DOI: 10.1016/j.compag.2003.12.002.
(http://www.sciencedirect.com/science/article/B6T5M-4BKN1RN-1/2/7422a5e38605a1300c7253672e742207)
Abstract:
The agri-food sector is facing global challenges that can only be met with support by information technologies (IT) on a level even beyond today's advanced IT utilizations. However, emerging technologies and their integration open the way for the development of integrated digital environments that could provide platforms for a reorganization of sector activities, and especially market related activities, capable of coping with the challenges ahead. The paper discusses the major IT development lines; the support potential of their integration; organizational requirements for the utilization of that potential and possible consequences for the future organization of the agri-food sector.
Keywords: Information technology impact; Agri-food sector; Organization

David A. A. Mossel, Corry B. Struijk, Assessment of the microbial integrity, sensu G.S. Wilson, of piped and bottled drinking water in the condition as ingested, International Journal of Food Microbiology, Volume 92, Issue 3, HPC Bacteria in Drinking Water: Public Health Implications, 1 May 2004, Pages 375-390, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2003.08.015.
(http://www.sciencedirect.com/science/article/B6T7K-4CCNC7B-4/2/56a43fb804e5cfeaf05e78a7c2e8841c)
Abstract:
The second half of the 20th century witnessed substantial progress in the assurance and verification of microbiological integrity, i.e., safety and sensory quality, of drinking water. Enteropathogenic agents, such as particular viruses and protozoa, not previously identified as transmitted by industrially provided water supplies, were demonstrated to cause disease outbreaks, when ingested with piped water. The potential harm posed by carry-over of orally toxic metabolites of organisms, producing `algal' (cyanophytic) blooms, was considered. In addition, earlier observations on the colonization of attenuated drinking water bodies by a variety of oligotrophic Gram-negative bacteria were confirmed and extended. This new evidence called for updating both water purification technologies and analytical methodology, serving to verify that goals had been attained.
For the former purpose, the hazard analysis empowering control of critical practices (HACCP) strategy, introduced about 1960 in industrial food processing, was successfully adopted. Elimination, devitalization or barrier technologies for the more recently identified water-borne pathogens were elaborated, taking account of the hazard of production of chlorinated compounds

with alleged adverse health effects. Biofilm formation throughout water distribution networks was brought under control by strict limitation of concentrations of compounds, assimilable by oligotrophic bacteria.
Upon acknowledging that direct detection tests for pathogens were futile, because of their most sporadic and erratic distribution, Schardinger's marker organism concept was anew embraced, rigorously revised and substantially enlarged. Misleading designations, like searches for `faecal coliforms' were replaced by boundary testing for Escherichia coli and appropriate Enterococcus spp. In addition, though still to be perfected, detection protocols for relevant bacteriophages or index viruses and, to a certain extent, also for spores of aerobic and anaerobic sporing rods were also elaborated. In all monitoring account was taken of sublethally injured target organisms, surviving purification technologies, though not deprived of their ecological significance. A need remains for a rigorously standardized operating procedure (SOP) for colony counts of psychrotrophic, oligotrophic Gram-negative rod-shaped bacteria (`heterotrophic plate count'), which constitute a useful criterion of indicator value.
As in the contemporary HACCP approach to food safety, guidelines for assessing success or failure in control of integrity (Water Safety Objectives) were empirically elaborated. These rely on surveys on water samples, originating from drinking water supplies, previously verified as complying with longitudinally integrated HACCP-based purification technologies.
Structured Academic dissemination of these innovations, through professional microbiologists to operator and executive levels, is recommended. Web based Distance Learning MSc Programmes, like the one, since the academic year 2003-2004, offered by the University of Hertfordshire, Hatfield, UK, may contribute to such endeavours. Though the complete Course is centered around Food Safety, the Modules in-Residence Practicals and Science and Technology of Drinking Water can be studied as an entity while being employed.
Keywords: Drinking water; Microbial Integrity Assurance; Standard Operating Procedures for assessing compliance; Water Safety Objectives; Precautionary Consumer Protection Strategy

Cheng-Jin Du, Da-Wen Sun, Recent developments in the applications of image processing techniques for food quality evaluation, Trends in Food Science & Technology, Volume 15, Issue 5, May 2004, Pages 230-249, ISSN 0924-2244, DOI: 10.1016/j.tifs.2003.10.006.
(http://www.sciencedirect.com/science/article/B6VHY-4BNVWPP-1/2/e4b6751edc4a585c979663040dcb4be7)
Abstract:
Image processing techniques have been applied increasingly for food quality evaluation in recent years. This paper reviews recent advances in image processing techniques for food quality evaluation, which include charge coupled device camera, ultrasound, magnetic resonance imaging, computed tomography, and electrical tomography for image acquisition; pixel and local pre-processing approaches for image pre-processing; thresholding-based, gradient-based, region-based, and classification-based methods for image segmentation; size, shape, colour, and texture features for object measurement; and statistical, fuzzy logic, and neural network methods for classification. The promise of image processing techniques for food quality evaluation is demonstrated, and some issues which need to be resolved or investigated further to expedite the application of image processing technologies for food quality evaluation are also discussed.

Dietrich Knorr, Marco Zenker, Volker Heinz, Dong-Un Lee, Applications and potential of ultrasonics in food processing, Trends in Food Science & Technology, Volume 15, Issue 5, May 2004, Pages 261-266, ISSN 0924-2244, DOI: 10.1016/j.tifs.2003.12.001.
(http://www.sciencedirect.com/science/article/B6VHY-4BRB7KK-1/2/fe0d81add197aeac07eabe85508cadfb)
Abstract:

Ultrasound has attracted considerable interest in food science and technology due to its promising effects in food processing and preservation. As one of the advanced food technologies it can be applied to develop gentle but targeted processes to improve the quality and safety of processed foods and offers the potential for improving existing processes as well as for developing new process options. Some applications like cutting or sieving have already found their place as state of the art technologies. Others are currently considered as possible candidates for industrial application. In this review selected and potential applications of ultrasound mainly in the field of food preservation and product modification are discussed.

Theib Oweis, Ahmed Hachum, Mustafa Pala, Water use efficiency of winter-sown chickpea under supplemental irrigation in a mediterranean environment, Agricultural Water Management, Volume 66, Issue 2, 15 April 2004, Pages 163-179, ISSN 0378-3774, DOI: 10.1016/j.agwat.2003.10.006.
(http://www.sciencedirect.com/science/article/B6T3X-4BBMTRF-2/2/8d03b8157e6a63c7364fea0419e8ff0e)
Abstract:
Chickpea is one of the major legume crops grown in the West Asia and North Africa (WANA) region. It has considerable importance as a food, feed and fodder. Traditionally, it is sown in spring as a rainfed crop in the region, which has highly variable and often insufficient rainfall. It is, therefore, largely raised on residual moisture, which results in low and variable yields and discourages farmers from investing inputs in its production. In the early 1990s, a winter-sown chickpea technology was developed that outweighs spring-sown chickpea in terms of productivity, water use efficiency and other traits. Limited supplemental irrigation can, however, play a major role in boosting and stabilizing the productivity of both spring-sown and winter-sown chickpea. Therefore, we investigated the effect of supplemental irrigation and sowing date on yield and water use efficiency in winter-sown chickpea.
An experiment was carried out over four cropping seasons (1997-2001) at ICARDA's main station at Tel Hadya, Aleppo, northern Syria (mean annual rainfall 330 mm). A cold-tolerant chickpea cultivar with improved resistance to ascochyta blight (ILC 3279, released as Ghab 2 in Syria) was grown in rotation with wheat. The experiment included three sowing dates (late November, mid-January, and late February) and four levels of supplemental irrigation (SI): full SI, 2/3 SI, 1/3 SI, and no SI, i.e. rainfed. The plots were replicated three times in a split-plot design, with date of sowing being the main plot treatment. Soil water content was monitored at approximately at 7-14-day intervals using a neutron probe. Crop evapotranspiration was determined for each subplot during each time interval, from sowing to harvest, using the soil-water balance equation. Water use efficiency was determined as the ratio of crop yield per unit area to seasonal evapotranspiration.
The results showed that chickpea yield per unit area increases with both earlier sowing and increased SI. However, water use efficiency under supplemental irrigation decreases with earlier sowing, due to the relatively large increase that occurs in the amount of evapotranspiration at early sowing dates. The study's results indicated that a 2/3 SI level gives the optimum water use efficiency for chickpea under supplemental irrigation. Under rainfed conditions, however, it was found that sowing chickpea around mid-January resulted in the highest WUE. The analysis also proposed a function, based on regression, which relates winter-sown chickpea yield to water use and which is applicable under both supplemental and rainfed conditions.
Keywords: Supplemental irrigation; Water use efficiency; Deficit irrigation; Sowing date; Chickpea; Rainfed agriculture

Dennis Wichelns, The policy relevance of virtual water can be enhanced by considering comparative advantages, Agricultural Water Management, Volume 66, Issue 1, 1 April 2004, Pages 49-63, ISSN 0378-3774, DOI: 10.1016/j.agwat.2003.09.006.

(http://www.sciencedirect.com/science/article/B6T3X-4B7YDW4-1/2/38b7bba375c9b5e6d53eb41989e77227)
Abstract:
The virtual water metaphor was created originally to gain the attention of public officials responsible for choosing policies that influence the use of water resources in arid regions. Over time, the metaphor has been used in both empirical and conceptual settings, primarily to describe the water used to produce crop and livestock products that are traded in international markets. Several authors have described how water-short countries can enhance their food security by importing water-intensive food crops. Some authors have noted similarities between the virtual water metaphor and the economic theory of comparative advantage. The virtual water metaphor addresses resource endowments, but it does not address production technologies or opportunity costs. Hence, the metaphor is not analogous to the concept of comparative advantage. The metaphor can be helpful in motivating public officials to consider policies that will encourage improvements in the use of scarce resources, but comparative advantages must be evaluated to determine optimal production and trading strategies. The theory of comparative advantage is explained and demonstrated in several scenarios that depict differences in resource endowments and production technologies. Optimal strategies are not always consistent with expectations based only on resource endowments. Policy discussions regarding water resources can be enhanced by considering comparative advantages when evaluating opportunities to import or export agricultural products.
Keywords: Economics; Opportunity costs; Water management; Water policy

Peter N Mascia, Richard B Flavell, Safe and acceptable strategies for producing foreign molecules in plants, Current Opinion in Plant Biology, Volume 7, Issue 2, April 2004, Pages 189-195, ISSN 1369-5266, DOI: 10.1016/j.pbi.2004.01.014.
(http://www.sciencedirect.com/science/article/B6VS4-4BMTS0P-7/2/322b2406e4b577f86e494483d321ec90)
Abstract:
The ability to express foreign genes using transgenic technologies has opened up options for producing large quantities of commercially important industrial or pharmaceutical products in plants. These technologies have made it possible to use well-developed systems of commercial agriculture that were developed principally to produce raw material for large-scale food, feed or processing applications for the production of foreign molecules. The possibility of the novel industrial or pharmaceutical molecules produced in such plants, or components derived from them, contaminating the environment and food chains has become especially controversial. This potential contamination has prompted detailed consideration of how such crops and the molecules that they produce can be effectively isolated and contained. First, the crop can be completely isolated physically from its food or feed counterpart during every aspect of its development and commercialization. Second, genetic isolation systems or genetic barriers that prevent normal reproduction can be used to reduce the likelihood of the industrial or pharmaceutical crop entering the food chain.

Steven M. Gendel, Riboprint analysis of Listeria monocytogenes isolates obtained by FDA from 1999 to 2003, Food Microbiology, Volume 21, Issue 2, April 2004, Pages 187-191, ISSN 0740-0020, DOI: 10.1016/S0740-0020(03)00054-6.
(http://www.sciencedirect.com/science/article/B6WFP-4BMC00W-8/2/419f88aeec847b8eb30a419094a8725f)
Abstract:
Listeria monocytogenes is a widespread human and animal pathogen. Despite the potential value of ribotyping for tracking patterns of strain distribution in Listeria monocytogenes, the application of this technology for this species has been limited to sets of isolates that are linked either by

epidemiology, geography, or food type. To broadly characterize the population structure of L. monocytogenes, automated ribotyping was carried out on a large set of unrelated isolates obtained by the US FDA from late 1999 to early 2003. The results showed the widespread occurrence of a few strains, and no indication of geographic or food-related stratification.
Keywords: Riboprint; Ribotyping; Molecular subtyping; Listeria monocytogenes

Roukayatou Zimmermann, Matin Qaim, Potential health benefits of Golden Rice: a Philippine case study, Food Policy, Volume 29, Issue 2, April 2004, Pages 147-168, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2004.03.001.
(http://www.sciencedirect.com/science/article/B6VCB-4C5PVJ8-1/2/5ae6c61e4f0de12ed09d68176709b920)
Abstract:
Golden Rice has been genetically modified to produce beta-carotene in the endosperm of grain. It could improve the vitamin A status of deficient food consumers, especially women and children in developing countries. This paper analyses potential impacts in a Philippine context. Since the technology is still at the stage of R&D, benefits are simulated with a scenario approach. Health effects are quantified using the methodology of disability-adjusted life years (DALYs). Golden Rice will not completely eliminate the problems of vitamin A deficiency, such as blindness or increased mortality. Therefore, it should be seen as a complement rather than a substitute for alternative micronutrient interventions. Yet the technology could bring about significant benefits. Depending on the underlying assumptions, annual health improvements are worth between US$ 16 and 88 million, and rates of return on R&D investments range between 66% and 133%. Due to the uncertainty related to key parameters, these results should be treated as preliminary.
Keywords: Biotechnology; Vitamin A; Micronutrient malnutrition; Health impacts; DALYs

Gabriella Caporale, Erminio Monteleone, Influence of information about manufacturing process on beer acceptability, Food Quality and Preference, Volume 15, Issue 3, April 2004, Pages 271-278, ISSN 0950-3293, DOI: 10.1016/S0950-3293(03)00067-3.
(http://www.sciencedirect.com/science/article/B6T6T-48Y6PGG-1/2/c1a3a940ffb1f1cb2d7216766bd28be6)
Abstract:
The purpose of this study is to investigate the extent to which consumer information concerning the manufacturing processes of beer can influence how acceptable the product is to the consumer. In this study subjects were informed that the beer had been produced (1) using genetically modified yeast; (2) with organic barley and hops, and (3) using traditional brewing technology. Three products were selected to represent high, moderate and low acceptability. A blind evaluation of the selected samples was followed by an assessment of the subjects' expectations of the sample products based on the different information about product processing. The impact of these expectations on liking after tasting the product was examined and demonstrated that information regarding manufacturing technology is capable of modifying the consumers' liking of beer. The disconfirmation that occurred as a result of different product-information combinations revealed that liking moved towards their expectations (assimilation). However assimilation was not complete, indicating that sensory properties of products were important in determining perceived quality. Finally, the present study does not entirely confirm findings of previous research. Combining different information with different levels of product liking may lead to a better understanding of the asymmetry of disconfirmation.
Keywords: Expectation; Sensory; Product information; Genetically modified food; Organic food; Beer

Frank Devlieghere, Lieve Vermeiren, Johan Debevere, New preservation technologies: Possibilities and limitations, International Dairy Journal, Volume 14, Issue 4, 3rd NIZO Dairy

Conference - Dynamics of Texture, Process and Perception (Part 2), April 2004, Pages 273-285, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2003.07.002.
(http://www.sciencedirect.com/science/article/B6T7C-49J8W3S-6/2/f7b9bc953ec030b873cdbd6f0f3fa702)
Abstract:
A lot of research in the field of food science has focused on new preservation technologies but very few of these methods have been implemented by the food industry until now. This article describes the most intensively investigated new preservation methods with their possibilities and especially their limitations, often hampering their implementation by the food industry. Many alternative `non-thermal' treatments have been proposed with high hydrostatic pressure and pulsed electrical fields being the most investigated ones. Both techniques allow killing of vegetative microorganisms but fail until now, when applied alone, to destroy spores. New packaging systems are introduced such as modified atmosphere packaging and active packaging systems. The latter systems have until now a limited application in practice due to incompatibility with legislation, limited effectivity and thermolability of active compounds. Natural compounds, such as essential oils, chitosan, nisin or lysozyme, are investigated to replace chemical preservatives and to obtain `green label' products. Their application is mainly hampered due to interaction of the natural compounds with food ingredients and due to changes in the organoleptical properties when introduced in a food. The application of protective cultures, able or unable to produce antimicrobial compounds such as bacteriocins are proposed to inhibit growth of unwanted microorganisms. The activity of bacteriocins is however often limited due to its narrow activity spectrum, its inactivation due to interaction with food ingredients or proteolytic action of the food, its limited diffusion in solid matrixes and the occurrence of loss of bacteriocinogenicity of the culture and of resistance of the target organisms. This overview nuances the application of the above mentioned preservation techniques and focuses on draw backs on their application by the food industry.
Keywords: High hydrostatic pressure; Pulsed electric fields; Packaging; Natural Preservatives; Protective cultures

J. Evan Ward, Sandra E. Shumway, Separating the grain from the chaff: particle selection in suspension- and deposit-feeding bivalves, Journal of Experimental Marine Biology and Ecology, Volume 300, Issues 1-2, VOLUME 300 Special Issue, 31 March 2004, Pages 83-130, ISSN 0022-0981, DOI: 10.1016/j.jembe.2004.03.002.
(http://www.sciencedirect.com/science/article/B6T8F-4C8FJW8-5/2/3990dd6b16f009b6fa386dc63fc1933a)
Abstract:
Particle feeding on suspended and deposited material is a common mode of food collection among many groups of the Metazoa. In particular, many members of the Mollusca, most notably the bivalves, have specialized in particle feeding. Because suspension- and deposit-feeding activities often play significant roles in ecosystem processes, particular attention has been given to the mechanisms of particle feeding by these molluscs, and to the impacts of environmental factors upon these mechanisms.
Early studies of the feeding organs of bivalve molluscs were descriptive and emphasis soon was placed upon the actual uptake of particulate material from the environment and identification of this material. Introduction of electronic particle counters led to a better understanding of the rates and efficiencies at which particle removal occurred, and the interface between food availability in the ocean and responses of these animals to temporal and spatial variability. While some early workers inferred the capabilities of these animals to select particles, it was the introduction of more advanced technologies (e.g., flow cytometry, video endoscopy, confocal microscopy) that allowed more detailed studies of the mechanisms associated with particle uptake and selection by these animals. These techniques have provided a more comprehensive analysis which clearly

demonstrate that the mechanisms associated with particle feeding and selection are complex, with species-specific processes based upon both physical and chemical characteristics of the particles. In this review, we summarize prior research on particle selection in suspension- and deposit-feeding bivalve molluscs, discuss current theory and controversy regarding these processes, and propose areas for further study. In particular, more research is needed to elucidate the mechanisms responsible for particle selection, particulate characteristics that impact selection, and the intrinsic and extrinsic factors that mediate these processes.
Keywords: Metazoa; Particle feeding; Molluscs

Bruce H. Robison, Deep pelagic biology, Journal of Experimental Marine Biology and Ecology, Volume 300, Issues 1-2, VOLUME 300 Special Issue, 31 March 2004, Pages 253-272, ISSN 0022-0981, DOI: 10.1016/j.jembe.2004.01.012.
(http://www.sciencedirect.com/science/article/B6T8F-4C8FJW8-9/2/964a12a11879c4ea26f25cfbb130d09b)
Abstract:
The deep pelagic habitat is a vast volume of cold, dark water where food is scarce and bioluminescence is the principal source of light and communication. Understanding the adaptations that allow animals to successfully inhabit this daunting realm has been a difficult challenge because investigators have had to conduct their work remotely. Research in the deep water column is going through an essential transformation from indirect to direct methods as undersea vehicles provide unprecedented access, new capabilities, and new perspectives. Traditional methods have accurately documented the meso- and macro-scale zoogeographic patterns of micronekton and zooplankton, as well as their distribution and migration patterns in the vertical plane. The new in situ technologies have enabled advances in studies of behavior, physiology, and in particular, the role of gelatinous animals in deep pelagic ecology. These discoveries reveal a deep-water fauna that is complex and diverse and still very poorly known.
Keywords: Behavior; Deep sea; Ecology; Pelagic fauna; Physiology; Undersea vehicles

A. Ardia, D. Knorr, V. Heinz, Adiabatic Heat Modelling for Pressure Build-up During High-pressure Treatment in Liquid-food Processing, Food and Bioproducts Processing, Volume 82, Issue 1, Mixing, Heat and Mass Transfer, March 2004, Pages 89-95, ISSN 0960-3085, DOI: 10.1205/096030804322985362.
(http://www.sciencedirect.com/science/article/B8JGD-4RV2DDV-G/2/4006b85494bd06b0ec6448bc77e0570c)
Abstract:
Pressure build-up is always accompanied by an increase of temperature in the product due to the transformation of energy during compression. Pure water and sucrose solutions were pressurized up to 600 MPa starting from different initial temperatures. The thermal history at the centre of the product was recorded and then related to the change in the thermo-physical properties of the product as a function of pressure, temperature and solid content. These thermo-physical properties were incorporated into a model equation and the predictions were compared with NIST (National Institute of Standards and Technology, Gaithersburg) database formulations--no significant deviations between the results and model predictions were found. Comparing the predicted results for sucrose solutions with the adiabating heating of a real product like orange juice also resulted in no significant deviations. The temperature distribution was then modelled all over the sample and used to predict the inactivation of relevant microorganisms in orange juice.
Keywords: adiabatic heating; high pressure; pressure build-up

I. Castro, J. A. Teixeira, S. Salengke, S. K. Sastry, A. A. Vicente, Ohmic heating of strawberry products: electrical conductivity measurements and ascorbic acid degradation kinetics, Innovative

Food Science & Emerging Technologies, Volume 5, Issue 1, March 2004, Pages 27-36, ISSN 1466-8564, DOI: 10.1016/j.ifset.2003.11.001.
(http://www.sciencedirect.com/science/article/B6W6D-4BVNK0B-3/2/745f56aa20deb5dd848bdfc27b0f0090)
Abstract:
The effects of field strength and multiple thermal treatments on electrical conductivity of strawberry products were investigated. Electrical conductivity increased with temperature for all the products and conditions tested following linear relations. Electrical conductivity was found to depend on the strawberry-based product. An increase of electrical conductivity with field strength was obvious for two strawberry pulps and strawberry filling but not for strawberry topping or strawberry-apple sauce. Thermal treatments caused visible changes (a decrease) in electrical conductivity values of both strawberry pulps tested, but the use of a conventional or ohmic pre-treatment induces a different behavior of the pulps' conductivity values. Ascorbic acid degradation followed first order kinetics for both conventional and ohmic heating treatments and the kinetic constants obtained were in the range of the values reported in the literature for other food systems. The presence of an electric field does not affect ascorbic acid degradation.
Keywords: Strawberry products; Electrical conductivity; Field strength; Ascorbic acid; Kinetics

G. A. Redmond, T. R. Gormley, F. Butler, The effect of short- and long-term freeze-chilling on the quality of cooked green beans and carrots, Innovative Food Science & Emerging Technologies, Volume 5, Issue 1, March 2004, Pages 65-72, ISSN 1466-8564, DOI: 10.1016/j.ifset.2003.11.002.
(http://www.sciencedirect.com/science/article/B6W6D-4BVNK0B-5/2/9676c1569e58648820bc143cea9eff43)
Abstract:
Freeze-chilling of food involves freezing and frozen storage followed by thawing and chilled storage. In this study, the effect of freeze-chilling on the quality of cooked green beans and carrots was examined, as was the effect of long and short-term frozen storage prior to thawing. Three process treatments were used in the short-term trial; chill, freeze-chill and freeze and the products were tested for firmness, colour, centrifugal drip loss, total viable count (TVC) and taste panel acceptability. Results showed that freeze-chilling and freezing led to softer cooked carrots ($P<0.001$) than chilling. However, freeze-chilling and freezing had no effect on the texture of cooked green beans ($P>0.05$) but led to significantly higher drip losses than chilling ($P<0.001$). Freeze-chilling and chilling led to paler green beans but this was not reflected in the taste panel acceptability scores. No difference in TVC was found between any of the process treatments for cooked carrots or green beans. In general, frozen storage (-25 [degree sign]C) for up to 12 months had no effect on firmness, drip loss, colour, total viable count or sensory acceptability of freeze-chilled cooked carrots and green beans compared to freezing.
Keywords: Freeze-chilling; Cooked carrots; Cooked green beans; Quality; Long-term frozen storage

Niels Skovgaard, Hurdle Technologies. Combination Treatments for Food Stability, Safety and Quality. Food Engineering Series: Editors: Lothar Leistner and Grahame Gould, Kluwer Academic/Plenum Publisher, New York, xiii+194 pages, hardback, 144.50 [euro]/125.00 USD/88.90 GBP; ISBN 0-306-47263-5; http://www.wkap.nl, International Journal of Food Microbiology, Volume 91, Issue 2, 1 March 2004, Page 224, ISSN 0168-1605, DOI: 10.1016/S0168-1605(03)00370-2.
(http://www.sciencedirect.com/science/article/B6T7K-49W6RR3-1/2/8e23ee267f3d569856c2df4974333f92)

J. S. Torrecilla, L. Otero, P. D. Sanz, A neural network approach for thermal/pressure food processing, Journal of Food Engineering, Volume 62, Issue 1, March 2004, Pages 89-95, ISSN 0260-8774, DOI: 10.1016/S0260-8774(03)00174-2.
(http://www.sciencedirect.com/science/article/B6T8J-494C88H-3/2/14cfbf03f1b39f08bc12aeab03935a1b)
Abstract:
High-pressure processing is an interesting technology for the food industry that offers some important advantages compared to thermal processing. But, the results obtained after a pressure treatment depend as much on the applied pressure as the temperature during the treatment. Modelling the thermal behaviour of foods during high-pressure treatments using physical-based models is a really hard task. The main difficulty is the almost complete lack of values for thermophysical properties of foods under pressure.
In this work, an artificial neural network (ANN) was carried out to evaluate its capability in predicting process parameters involved in thermal/pressure food processing. The ANN was trained with a data file composed of: applied pressure, pressure increase rate, set point temperature, high-pressure vessel temperature, ambient temperature and time needed to re-equilibrate temperature in the sample after pressurisation. When ANN was trained, it was able to predict accurately this last variable. Then, it becomes a useful alternative to physical-based models for process control since thermophysical properties of products implied are not needed in modellisation.
Keywords: Neural network; High pressure; Food processing; Modelling

Lajos Szente, Jozsef Szejtli, Cyclodextrins as food ingredients, Trends in Food Science & Technology, Volume 15, Issues 3-4, NFIF Part 1, March-April 2004, Pages 137-142, ISSN 0924-2244, DOI: 10.1016/j.tifs.2003.09.019.
(http://www.sciencedirect.com/science/article/B6VHY-4BMC9H1-1/2/965f8fa79cb586668766b13c8de84d2b)
Abstract:
The present paper deals with the practical aspects of the utilization of cyclodextrins and cyclodextrin complexes in the food industry. The molecular encapsulation of lipophilic food ingredients with cyclodextrin improves the stability of flavours, vitamins, colourants and unsaturated fats, etc., both in physical and chemical sense leading to extended product shelf-life. Accelerated and long-term storage stability test results showed that the stability of cyclodextrin-entrapped food ingredients surpassed that of the traditionally formulated ones. Technological advantages of the use of cyclodextrins in foods and food processing technologies are also manifested in improved sensory, nutritional and performance properties. Examples of marketed cyclodextrin-based food products for demonstration of the significance of cyclodextrin technology in the food industry are provided.

Marina Carbonaro, Proteomics: present and future in food quality evaluation, Trends in Food Science & Technology, Volume 15, Issues 3-4, NFIF Part 1, March-April 2004, Pages 209-216, ISSN 0924-2244, DOI: 10.1016/j.tifs.2003.09.020.
(http://www.sciencedirect.com/science/article/B6VHY-4BFXT1G-4/2/5f349d8d9ac035652ca04ed7c78fdd90)
Abstract:
Initially aimed at the identification of proteins expressed by a genome, proteomics now involves a study of their structure, localization, modification, interactions and functions, that is largely taking advantage by progress in mass spectrometry (i.e. Q-TOF mass spectrometer for MS/MS based protein identification) and in robotics-based technology. A new challenge for proteomics has recently been recognized pointing out differences in food proteomes relevant for nutrition. Present knowledge and future potential application of proteomics in food quality assessment will be focused in this report.

Kirsten Engell-Sorensen, Josianne G. Stottrup, Martin Holmstrup, Rearing of flounder (Platichthys flesus) juveniles in semiextensive systems, Aquaculture, Volume 230, Issues 1-4, 16 February 2004, Pages 475-491, ISSN 0044-8486, DOI: 10.1016/S0044-8486(03)00437-X.
(http://www.sciencedirect.com/science/article/B6T4D-4967GY0-1/2/ea18f694634d15ba8770e362aafcfdf8)
Abstract:
A low-technology rearing system was implemented for rearing juvenile flounder for stock enhancement in a Danish fjord, the Limfjord. Each year during 1996-2002, between 13,000 and 153,000 juveniles were reared from the yolk-sac stage until metamorphosis in outdoor ponds relying on phyto- and zooplankton blooms as their main food source. In contrast to other similar systems, the blooms in this system are closely monitored and, to a certain extent, regulated. The zooplankton blooms consisted mainly of calanoid copepods, dominated by the species Temora longicornis and Centropages hamatus. Most juveniles produced (>99.5%) were normally pigmented with average yearly survival rates from hatch to metamorphosis varying from 7+/-9% to 48+/-18%, lowest in the first years of production.
Keywords: Flatfish culture; Flounder; Platichthys flesus; Calanoid copepods

Rosamond L. Naylor, Walter P. Falcon, Robert M. Goodman, Molly M. Jahn, Theresa Sengooba, Hailu Tefera, Rebecca J. Nelson, Biotechnology in the developing world: a case for increased investments in orphan crops, Food Policy, Volume 29, Issue 1, February 2004, Pages 15-44, ISSN 0306-9192, DOI: 10.1016/j.foodpol.2004.01.002.
(http://www.sciencedirect.com/science/article/B6VCB-4BYRST9-1/2/2d3890f5b6d9137e6f0bf42e2d54e998)
Abstract:
This article examines the opportunities for using several forms of modern biotechnology to improve orphan crops in developing countries. These crops, including tef, millets, cowpea, and indigenous vegetables, fruits, roots, and tubers, tend to be locally important, but receive little public or private investment. Recent advances in the fields of genetics and genomics provide a more unified understanding of the biology of plants. We summarize some important ways in which genetic technologies can be harnessed for orphan crops and provide examples of potential genetic and genomics research that is likely to benefit poor regions. Finally, we suggest policies that could help create incentives for application of advanced science to orphan crops.
Keywords: Biotechnology; Orphan crops; Germplasm improvement; Genomics; Direct gene transfer; Food security

M. M. Gongora-Nieto, P. D. Pedrow, B. G. Swanson, G. V. Barbosa-Canovas, Use of circuit analysis simulations in pulsed electric fields food processing, Journal of Food Engineering, Volume 61, Issue 3, February 2004, Pages 413-420, ISSN 0260-8774, DOI: 10.1016/S0260-8774(03)00149-3.
(http://www.sciencedirect.com/science/article/B6T8J-491RRC8-1/2/5c0f0588dded641a10a460709cb2cbe0)
Abstract:
In pulsed electric field (PEF) technology, treatment intensity during food preservation is defined by two processing variables: electric field and treatment time. These variables are evaluated by high voltage and current sensors located in the PEF system. Proper sensor location is very important in obtaining valid processing variables. This paper investigated the use of circuit analysis aided by PSpice(TM) (OrCAD(TM), Demo Version 9.1, Beaverton OR) software to evaluate the impact of voltage and current sensor location on the accuracy of electric field, pulse width, and energy calculations during PEF food processing. PSpice(TM) software was used to conduct the circuit analysis of a typical PEF electrical circuit and to analyze the behavior of the electrical transient

delivered by the PEF circuit to a coaxial food treatment chamber. A saline solution ([sigma]=0.47 S/m at 20 [degree sign]C) was used to verify the effect of sensor location in a PEF pilot plant-scale electric circuit. A pulse generator delivering slightly overdamped transients with charging voltages from 30 to 40 kV was used. Of the three electrical parameters, the most affected by improper placement of voltage sensors was the electric field, which can be measured at up to ~10% higher than that experienced by the food in the PEF treatment chamber gap. Also, good agreement between the PSpice(TM) simulation and experimental results was verified. If the electrical behavior of the PEF system is not known and the sensors are inappropriately placed far from the PEF chamber, the validity of kinetic data and conclusions drawn on the effectiveness of certain processing conditions will be significantly limited.
Keywords: Pulsed electric fields; Circuit analysis; Energy measurement; Mathematical simulation

Douglas L. Archer, Freezing: an underutilized food safety technology?, International Journal of Food Microbiology, Volume 90, Issue 2, 15 January 2004, Pages 127-138, ISSN 0168-1605, DOI: 10.1016/S0168-1605(03)00215-0.
(http://www.sciencedirect.com/science/article/B6T7K-4903GTK-2/2/e84ff35302cd15be5b75497f99393cbd)
Abstract:
Freezing is an ancient technology for preserving foods. Freezing halts the activities of spoilage microorganisms in and on foods and can preserve some microorganisms for long periods of time. Frozen foods have an excellent overall safety record. The few outbreaks of food-borne illness associated with frozen foods indicate that some, but not all human pathogens are killed by commercial freezing processes. Freezing kills microorganisms by physical and chemical effects and possibly through induced genetic changes. Research is needed to better understand the physical and chemical interactions of various food matrices with the microbial cell during freezing and holding at frozen temperatures. The literature suggests that many pathogenic microorganisms may be sublethally injured by freezing, so research should be done to determine how to prevent injured cells from resuscitating and becoming infectious. Studies on the genetics of microbial stress suggest that the induction of resistance to specific stresses may be counteracted by, for example, simple chemicals. Research is needed to better understand how resistance to the lethal effect of freezing is induced in human pathogens and means by which it can be counteracted in specific foods. Through research, it seems possible that freezing may in the future be used to reliably reduce populations of food-borne pathogens as well as to preserve foods.
Keywords: Freeze-induced lethality; Microbicidal freezing; Freezing; Stress-induced resistance; Frozen food safety; Hurdle technology

B. Mintesinot, H. Verplancke, E. Van Ranst, H. Mitiku, Examining traditional irrigation methods, irrigation scheduling and alternate furrows irrigation on vertisols in northern Ethiopia, Agricultural Water Management, Volume 64, Issue 1, 1 January 2004, Pages 17-27, ISSN 0378-3774, DOI: 10.1016/S0378-3774(03)00194-X.
(http://www.sciencedirect.com/science/article/B6T3X-49CMXWV-2/2/bc2223c3afb6daf4948c08ca3dc69815)
Abstract:
In northern Ethiopia, where traditional (farmers) irrigation management on Vertisols is widely practiced, sustainable food security has always been a challenge. The reasons for this are multi-dimensional, but of utmost importance is, low-tech irrigation water management. The main objective of the present study is, therefore, to examine technologies of irrigation water management that might enable farmers to increase water productivity (WP) on vertisols.
A comparative study has been undertaken between the traditional irrigation management (every furrow-traditional scheduling) and alternative water management options on maize plots in northern Ethiopia. The options include alternate furrows-scientific scheduling and every furrow-

scientific scheduling. A field experiment was undertaken over two irrigation seasons (1998/1999 and 1999/2000). Results were compared on the basis of yield, WP and economic productivity concepts.
Yield-based comparison has shown that every furrow-scientific scheduling generates the highest yield levels followed by alternate furrows-scientific scheduling. The yield increase (by every furrow-scientific scheduling) over the traditional management was found to be 54%.
WP-based comparison has shown that alternate furrows-scientific scheduling generates the highest WP values followed by every furrow-scientific scheduling. The increase (by alternate furrow irrigation, scientific scheduling) over the traditional irrigation management was 58%.
Economic productivity-based comparison has shown that the highest economic return was obtained from every furrow-scientific scheduling followed by alternate furrows-scientific scheduling. The increase in income (by every furrow-scientific scheduling) over the traditional irrigation management was 54%.
The overall observation is that depending on the availability of water and labour resources, one can decide to use either of the alternate management options to obtain economically reasonable yield. In northern Ethiopia, where water is limiting (and not labour), every furrow-scientific scheduling can be an option.
Keywords: Alternate furrows-scientific scheduling; Every furrow-scientific scheduling; Water productivity; Economic returns (productivity)

Rex Montgomery, Development of biobased products, Bioresource Technology, Volume 91, Issue 1, January 2004, Pages 1-29, ISSN 0960-8524, DOI: 10.1016/S0960-8524(03)00154-8.
(http://www.sciencedirect.com/science/article/B6V24-49CMSPR-3/2/6c45f33f29f18c23fec3c963ee3399bb)
Abstract:
Research conducted over the past seven years by the biotechnology byproducts consortium (BBC) addresses its mission to investigate the opportunities to add value to agricultural products, byproducts and coproducts and to manage the wastewater arising from agribusinesses in an environmentally favorable way. Since a wide variety of research approaches have been taken, the results are collected in five topic groups: (1) bioremediation that includes anaerobic fermentations of wastes to produce methane and hydrogen, the genetics of methanogenesis and in situ remediation of contaminated aquifer systems, landfill leachates and industrial effluents; (2) land application of fermentation byproducts and their use in animal feeds; (3) biocatalytic studies of transformations of components of corn and soybean oils, peroxidases present in plant products, such as soybean hulls; (4) biochemical reactions for the production of de-icers from industrial water streams, biodiesel production from fats and greases, biodegradable plastics from polymerizable sugar derivatives, single cell foods derived from fungal growth on waste streams, and bacterial polysaccharides from Erwinia species; (5) separation and recovery of components by membrane technologies.
Keywords: Bioremediation; Anaerobic fermentations; Methanogenesis in situ remediation; Land and animal feeds; Biocatalysis; De-icers; Biodiesels; Biodegradable plastics; Bacterial polysaccharides; Separations

John F. Kennedy, Yu-Tien Lin, Food Chemical Composition: Dietary Significance in Food Manufacturing (Key Topics in Food Science and Technology, No. 6): Tim Hutton; CCFRA/RSC, Chipping Campden/Cambridge, UK, 2002, vi+111 pages, ISBN 0-905942-50-7, Carbohydrate Polymers, Volume 55, Issue 1, 1 January 2004, Page 115, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2003.08.010.
(http://www.sciencedirect.com/science/article/B6TFD-49R5G9V-4/2/16917cb24626e582aaa5050442434e82)

M. Z. Abdullah, L. C. Guan, K. C. Lim, A. A. Karim, The applications of computer vision system and tomographic radar imaging for assessing physical properties of food, Journal of Food Engineering, Volume 61, Issue 1, Applications of computer vision in the food industry, January 2004, Pages 125-135, ISSN 0260-8774, DOI: 10.1016/S0260-8774(03)00194-8.
(http://www.sciencedirect.com/science/article/B6T8J-49326RK-5/2/a380cf844b0dacb87fafb7588b6365a9)
Abstract:
In making physical assessment of agricultural materials and foodstuffs, images are undoubtedly the preferred method in representing concepts to human brain. Regardless of the product, from fresh fruits to prepared foods, colour and moisture content are two important attributes which are regularly being sought by food as well as agricultural engineers. Although these attributes can traditionally be assessed with wide assortment of equipment, however, they generally lack spatial resolution since measurements were often integrated over a small area. This paper focuses on image acquisition technologies which can reveal the information of interest in two dimensions using visible and non-visible band of radiation. Respectively, the technologies investigated are the machine vision system and the computerised radar tomography. The first one was applied for colour grading of oil palms and the second one was used to map the moisture content in grain. The vision system correctly classified 92% of the stationary oil palms by four grade categories, and the radar tomography accurately mapped grain anomalies at 1 GHz over 12-39% moisture range.
Keywords: Quality evaluation; Machine vision; Automated inspection; Oil palm grading; Travel-time tomography; Moisture content; Dielectric permittivity; Rice imaging

P.V. Vissoh, G. Gbehounou, A. Ahanchede, T.W. Kuyper, N.G. Roling, Weeds as agricultural constraint to farmers in Benin: results of a diagnostic study, NJAS - Wageningen Journal of Life Sciences, Volume 52, Issues 3-4, 2004, Pages 305-329, ISSN 1573-5214, DOI: 10.1016/S1573-5214(04)80019-8.
(http://www.sciencedirect.com/science/article/B94T2-4WFBS5G-5/2/e3bd41e8ac321555547e96b78bd268dc)
Abstract:
Weeds are an emerging constraint on crop production, as a result of population pressure and more intensive use of cultivated land. A diagnostic study was carried out from June through August 2002 in the five agro-ecological zones of Benin (1) to identify the relative importance of weeds among major production constraints, (2) to better understand farmers' perceptions of weed problems, and (3) to take cognizance of their reactions and the different actors involved in weed management technology development. The study also aimed at suggesting the development of weed management strategies that work and are acceptable under small-scale farmers' conditions. Data were collected through semi-structured and unstructured group and/or individual interviews, and through participant observation, transect studies and weed identification during field visits. The results show considerable diversity in biophysical constraints and socio-economic conditions. Population density has led to high pressure on arable land, resulting in land degradation and weed problems. In all situations, pernicious (Imperata cylindrica, Cyperus spp., Commelina spp.) and parasitic (Striga spp.) weeds are difficult to eradicate, causing substantial food crop yield losses and threatening the livelihood of people. Land and labour shortage, low commodity prices and lack of credit were the main constraints hindering weed management. Causes, effects and consequences were analysed, taking into account the socio-economic context. The study's findings with respect to weed management measures, and their adaptation and constraints in using them, suggest that effective and acceptable weed management strategies should be developed, taking into account both biological and social science perspectives with a focus on adding value to indigenous knowledge.
Promising strategies for discovery learning about weed management were identified, in order to foster sustainable crop production in Benin.

Keywords: cropping systems; indigenous knowledge; participatory technology development

Joseph H. Hulse, Biotechnologies: past history, present state and future prospects, Trends in Food Science & Technology, Volume 15, Issue 1, January 2004, Pages 3-18, ISSN 0924-2244, DOI: 10.1016/S0924-2244(03)00157-2.
(http://www.sciencedirect.com/science/article/B6VHY-49YD20G-1/2/4241d4deb9646989c67461ecd6d20379)
Abstract:
The paper presents a chronological review of biotechnologies, ancient and modern. It outlines the discovery of naturally occurring drugs by Babylonians, Egyptians, Chinese, Greeks and Romans, and the evolution of extraction, preservation and transformation technologies. It describes how pharmaceuticals progressed from empiricism, through chemical identification and synthesis to modern advances in genomics, proteomics, bio-informatics and syntheses by cultured cells from various genetically modified organisms. While biotechnologies for drugs first progressed through chemistry, until relatively recently food technologies evolved by mechanisation, the gradual replacement of human hands by machines. Present and predicted industrial demand for bioengineers exceeds supply. The cost and complexity of emerging biotechnologies call for significant revision of curricula and reorganisation of acedemic departments related to life sciences and biotechnologies. Urgently needed is active interdisciplinary cooperation in research and development, both in universities and industries, cooperation involving biochemists, bioengineers, mathematicians, computational scientists, systems analysts and specialists in bioinformatics. Bioscientists and biotechnologists must acquire more sensitive awareness of civil societies concerns and the ability to communicate with private citizens, politicians and the media. Recognising the inexorably rising demand for reliable health services, for safe and adequate food supplies, present and future opportunities for employment in industries devoted to food and drug technologies have never been greater.