Science direct 2006

machine comp feed (76 Judul)

C. Jensen, M.R. Weisbjerg, T. Hvelplund, Evaluation of methods for estimating the amino acid supply to the duodenum of microbial, endogenous and undegraded feed protein on maize silage diets fed to dairy cows,
Animal Feed Science and Technology, Volume 131, Issues 1-2, 15 November 2006, Pages 1-24, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.01.024.
(http://www.sciencedirect.com/science/article/B6T42-4JCCJRP-1/2/6d2b6ce44bb8b2a7f1595abf23aab1d2)

Abstract:
The effect of stage of maturity of maize silage on protein metabolism in the gastrointestinal tract of cows was evaluated in an extended 3 x 3 Latin square experiment. Three multiparous lactating Danish Holstein-Friesian cows fitted with ruminal, duodenal and ileal cannulae were offered maize silage based diets supplemented with soybean meal and a grass-clover hay. The three treatments differed in the dry matter (DM) content of the maize silage, being 257, 350 or 403 g/kg. Rumen bacteria were harvested from mixed samples of rumen particles and fluid by sequential centrifugations. Protozoa were harvested by centrifugation after clearance of rumen fluid by flocculation. Synthesis of microbial amino acid nitrogen (AAN) was estimated by the internal markers diaminopimelic acid (DAPA), RNA and total and individual purine bases. Undegraded feed AAN was estimated by the in situ nylon bag method. Further, the origin of duodenal N flow was estimated by use of the amino acid profile (AAP) method. Average DMI was 15.9 kg/day. Average N and AAN intakes were 0.457 and 0.329 kg/day, respectively. The duodenal flow of N tended to increase from 0.484 to 0.581 kg/day with increased maturity of maize (P=0.08). Effective protein degradability (EPD) for the maize silage, the soybean meal and the grass-clover hay was 0.84, 0.71 and 0.57, respectively. Apparent differences were found in the bacterial and protozoal amino acid (AA) profiles (g AA/kg total AA), especially for Lys and Ala. Purine profiles (mmol purine/mol total purine) differed for three out of five purines between bacteria and protozoa. The internal RNA marker estimated a microbial AAN net synthesis of 0.165-0.204 kg/day. Using the AAP method to estimate the distribution of duodenal protein resulted in the fractions: microbial 0.56, endogenous 0.23 and undegraded feed AAN 0.21. It was not possible to make reasonable estimates using the purine profiles. Average microbial net synthesis of AAN estimated by AAP method (0.198 kg/day) and RNA marker method (0.184 kg/day), respectively, was comparable. A duodenal AAN flow of 0.112 kg/day of undegraded feed protein estimated by in situ degradation was 1.5 times higher than the 0.074 kg/day estimated from the AAP method. A substantial amount (0.081 kg/day) of endogenous AAN was estimated from the AAP method. The AAP method seemed reliable in this experiment for estimating the supply of protein to duodenum from a number of sources.

Keywords: N-metabolism; Bacteria; Protozoa; Amino acid profile; Purine bases; Maize; Silage

Marta Benito Garzon, Radim Blazek, Markus Neteler, Rut Sanchez de Dios, Helios Sainz Ollero, Cesare Furlanello, Predicting habitat suitability with machine learning models: The potential area of Pinus sylvestris L. in the Iberian Peninsula,
Ecological Modelling, Volume 197, Issues 3-4, 25 August 2006, Pages 383-393, ISSN 0304-3800, DOI: 10.1016/j.ecolmodel.2006.03.015.
(http://www.sciencedirect.com/science/article/B6VBS-4JRVBDK-5/2/6b75f12e4a096f17439ecf5c766c94c1)

Abstract:
We present a modelling framework for predicting forest areas. The framework is obtained by integrating a machine learning software suite within the GRASS Geographical Information System (GIS) and by providing additional methods for predictive habitat modelling. Three machine learning techniques (Tree-Based Classification, Neural Networks and Random Forest) are available in parallel for modelling from climatic and topographic variables. Model evaluation and parameter selection are measured by sensitivity-specificity ROC analysis, while the final presence and absence maps are obtained through maximisation of the kappa statistic. The modelling framework is applied at a resolution of 1 km with Iberian subpopulations of Pinus sylvestris L. forests. For this data set, the most accurate algorithm is Breiman's random forest, an ensemble method which provides automatic combination of tree-classifiers trained on bootstrapped subsamples and randomised variable sets. All models show a potential area of P. sylvestris for the Iberian Peninsula which is larger than the present one, a result corroborated by regional pollen analyses.
Keywords: Machine learning; Random forest; Neural networks; Classification and regression trees; AUC; Kappa; Iberian Peninsula; Pinus sylvestris L.; Habitat suitability

M.E. Rivas-Vega, E. Goytortua-Bores, J.M. Ezquerra-Brauer, M.G. Salazar-Garcia, L.E. Cruz-Suarez, H. Nolasco, R. Civera-Cerecedo, Nutritional value of cowpea (Vigna unguiculata L. Walp) meals as ingredients in diets for Pacific white shrimp (Litopenaeus vannamei Boone),
Food Chemistry, Volume 97, Issue 1, July 2006, Pages 41-49, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2005.03.021.
(http://www.sciencedirect.com/science/article/B6T6R-4G7NT70-1/2/408d6e9d5011001249f4576a4fc58543)

Abstract:
The nutritional value of cowpea (Vigna unguiculata L. Walp) meals, as ingredients in diets for Litopenaeus vannamei, was evaluated. Five experimental meals were prepared in the laboratory: whole raw cowpea (WRC), dehulled (DC), cooked (CC), germinated (GC) and extruded (EXC). The crude protein content of WRC (26.1%) increased after germination (29.5%). Carbohydrates ranged from 69.4% to 85.9%. The trypsin inhibitor activity of WRC meal was low (7.52 U/mg dry matter), and was reduced or eliminated by cooking and extrusion. Apparent digestibility of dry matter, protein and carbohydrate of the diet containing whole raw cowpea meal (71.1%, 85.9% and 76.7%, respectively) was similar to the control diet. Cooking and extruding of cowpea significantly increased dry matter, protein and carbohydrate digestibility in the diets. The results suggest that

cowpea meals are good sources of nutrients and can be used as ingredients in diets for L. vannamei.

Keywords: Cowpea meals; Vigna unguiculata; Feed ingredients; Digestibility; Litopenaeus vannamei

Jaime Sieres, Jose Fernandez-Seara, Evaluation of the column components size on the vapour enrichment and system performance in small power NH3-H2O absorption refrigeration machines,

International Journal of Refrigeration, Volume 29, Issue 4, June 2006, Pages 579-588, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2005.10.004.
(http://www.sciencedirect.com/science/article/B6V4R-4HVDJH5-2/2/9577aef2502e261ea6b5ee86c68b45f4)

Abstract:
This paper presents an analysis of the influence of the distillation column components size on the vapour enrichment and system performance in small power NH3-H2O absorption machines with partial condensation. It is known that ammonia enrichment is required in this type of systems; otherwise water accumulates in the evaporator and strongly deteriorates the system performance and efficiency. The distillation column analysed consists of a stripping adiabatic section below the column feed point and an adiabatic rectifying packed section over it. The partial condensation of the vapour is produced at the top of the column by means of a heat integrated rectifier with the strong solution as coolant and a water cooled rectifier. Differential mathematical models based on mass and energy balances and heat and mass transfer equations have been developed for each one of the column sections and rectifiers, which allow defining their real dimensions. Results are shown for a given practical application. Specific geometric dimensions of the column components are considered. Different distillation column configurations are analysed by selecting and discarding the use of the possible components of the column and by changing their dimensions. The analysis and comparison of the different column arrangements has been based on the system COP and on the column dimensions.

Keywords: Absorption system; Ammonia-water; Survey; Component; Distillation; Performance; Concentration; Vapour; Systeme a absorption; Ammoniac-eau; Enquete; Composant; Distillation; Performance; Concentration; Vapeur

Kenzo Yoseda, Shigeki Dan, Takuma Sugaya, Ken Yokogi, Masaru Tanaka, Shinsyu Tawada, Effects of temperature and delayed initial feeding on the growth of Malabar grouper (Epinephelus malabaricus) larvae,

Aquaculture, Volume 256, Issues 1-4, 15 June 2006, Pages 192-200, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.01.031.
(http://www.sciencedirect.com/science/article/B6T4D-4JFGF6G-2/2/588f0c492aa9e7b822f0e0ed22913563)

Abstract:
This study investigated the impact of delayed initial feeding on the growth and survival of early stage Malabar grouper Epinephelus malabaricus larvae in relation to the absorption of endogenous reserves under different temperature conditions. Two experiments were conducted as follows: experiment 1 was conducted to examine the

process of yolk and oil globule absorption in the larvae during endogenous feeding at three different temperatures (25, 28, and 31 [degree sign]C). Mean volume of yolk sac for 25 [degree sign]C (25.2 +/- 0.58) was significantly larger than for 28 [degree sign]C (28.1 +/- 0.15) and 31 [degree sign]C (31.0 +/- 0.25) at larval onset of mouth opening and at onset of feeding, with the absorption of yolk sac and oil globule having a tendency to be consumed more rapidly with increasing temperature.
Experiment 2 was carried out to investigate the effect of delayed initial feeding on the subsequent growth and survival at five different feeding regimes at 28 [degree sign]C. The larvae were fed a small S-type of Thai strain rotifers at a density of 20 ind./ml except for Group 5 (Gp. 5). Gp. 1: rotifers fed initially from the onset of mouth opening, Gp. 2: rotifers fed initially from 6 h after mouth opening (HAMO), Gp. 3: rotifers fed initially from 12 HAMO, Gp. 4: rotifers fed initially from 24 HAMO, and Gp. 5: starved control. Larval growth showed significant differences between Gp. 1-3 and Gp. 4-5 at the end of the experiment, 96 HAMO ($P < 0.05$). In contrast, starved larvae (Gp. 5) showed the negative growth from 24 to 96 HAMO. The beginning of negative growth point coincided with the time of complete oil globule absorption at 28 [degree sign]C. These results indicate that larval growth was closely related with endogenous reserves, and larvae possess a very short period during which they are resistant to food deprivation. We conclude that their growth was affected if they fail to initially feed within 24 HAMO at 28 [degree sign]C.
Keywords: Malabar grouper; Epinephelus malabaricus; Endogenous reserves; Initial feeding; Growth; Survival

M. Volanis, P. Zoiopoulos, E. Panagou, C. Tzerakis, Utilization of an ensiled citrus pulp mixture in the feeding of lactating dairy ewes**,**
Small Ruminant Research**,** Volume 64, Issues 1-2, July 2006, Pages 190-195, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2005.04.013.
(http://www.sciencedirect.com/science/article/B6TC5-4JVTCG9-1/2/11c003dbb003226e0f6cf4e42d4efbf5)
Abstract:
Sixty-six 18-month-old lactating ewes of the Sfakian dairy sheep breed were used to study the effects of feeding a citrus pulp silage mixture on ewes milk yield and milk composition. Three kilogram of citrus pulp silage mixture with by-products was offered daily to the ewes as experimental treatment, replacing part of the supplemental feed/pelleted lucerne/oat hay diet given to the controls. Silage pH dropped from 4.79, before ensiling to 3.43 following ensiling. DM of silage was 25.6% lower at the end of ensiling (24.6% versus 18.3%). The orange pulp silage mixture proved palatable to sheep particularly due to its pleasant odour. Milk yield and milk composition were measured for a 9-week period. Mean daily milk yield was 3% higher for controls (653 +/- 46.0 g versus 634 +/- 45.3 g) not significantly though ($p > 0.05$), but the situation was reversed (6.6% lower) when the 6% FCM yield was considered (636 +/- 462 g versus 678 +/- 45.6 g). Ewes fed orange pulp silage had 17% higher fat and 5.4% higher non-fat-solids content in milk ($p < 0.001$ for both milk components). Treatment differences in ewes body weights were not significant during the experimental period. Results show that the inclusion of ensiled citrus pulp in diets of lactating ewes is a viable proposition,

particularly for the dairy breed of sheep whose milk is used in the cheese manufacturing industry.

Keywords: Citrus pulp mixture; Silage; Sfakian sheep; Milk yield; Milk composition

Ljupco Todorovski, Saso Dzeroski, Integrating knowledge-driven and data-driven approaches to modeling,
Ecological Modelling, Volume 194, Issues 1-3, Special Issue on the Fourth European Conference on Ecological Modelling - Selected Papers from the Fourth European Conference on Ecological Modelling, September 27 - October 1, 2004, Bled, Slovenia, 25 March 2006, Pages 3-13, ISSN 0304-3800, DOI: 10.1016/j.ecolmodel.2005.10.001.
(http://www.sciencedirect.com/science/article/B6VBS-4HNYMSD-2/2/fb94e6e7a42f7df73c6ffba53bc12834)

Abstract:
In this paper, we present a framework for modeling dynamic systems that integrates the knowledge-based theoretical approach to modeling with the data-driven empirical modeling. The framework allows for integration of modeling knowledge specific to the domain of interest in the process of model induction from measured data. The knowledge is organized around the central notion of basic processes in the domain and it includes models thereof as well as guidelines for combining models of individual processes into a model of the entire observed system. The presented framework is applied to three tasks of modeling dynamic environmental systems from noisy measurement data in the domains of population and hydro dynamics. In all applications, the models induced with the framework can be used both to accurately predict and explain the behavior of the observed dynamic systems.

Keywords: Computational scientific discovery; Machine learning; Dynamic systems; Aquatic ecosystems; Hydrodynamics

A.S. Lithourgidis, I.B. Vasilakoglou, K.V. Dhima, C.A. Dordas, M.D. Yiakoulaki, Forage yield and quality of common vetch mixtures with oat and triticale in two seeding ratios, ***Field Crops Research***, Volume 99, Issues 2-3, 30 October 2006, Pages 106-113, ISSN 0378-4290, DOI: 10.1016/j.fcr.2006.03.008.
(http://www.sciencedirect.com/science/article/B6T6M-4JWMT5X-1/2/8c3fe9ce95a66c930f35ef2846011b00)

Abstract:
Mixtures of annual forage legumes with winter cereals for forage production are used extensively in the Mediterranean region. Common vetch (Vicia sativa L.), oat (Avena sativa L.), and triticale (xTriticosecale Wittmack) monocultures as well as mixtures of common vetch with each of the above cereals, in two seeding ratios (55:45 and 65:35), were used to investigate forage yield and quality as well as the effect of intercropping on growth rate of the three species used in the mixtures. Oat and triticale monocultures as well as both common vetch-oat mixtures provided greater forage yield than mixtures of common vetch with triticale and monoculture common vetch. Total relative yield exceeded unity in common vetch-oat (65:35) indicating that at this seeding rate there was an advantage of intercropping in using the environmental resources. Growth rate of common vetch, oat, and triticale in mixtures was lower than that in monocultures. Crude

protein content was highest in monoculture common vetch followed by common vetch-oat (65:35). However, quality characteristics such as lignin content, neutral detergent fiber, total digestible nutrients and to a much smaller degree the acid detergent fiber, digestible dry matter, dry matter intake and relative feed value were affected by intercropping. Highest forage quality was achieved when common vetch was grown as a monoculture or when at a high proportion in mixtures, especially with oat. The results showed that mixture of common vetch with oat at the 65:35 seeding ratio achieved a higher forage yield and protein content than the other mixtures studied.

Keywords: Common vetch; Crude protein; Forage; Growth rate; Intercropping; Oat; Triticale

R. Casals, G. Caja, M.V. Pol, X. Such, E. Albanell, A. Gargouri, J. Casellas, Response of lactating dairy ewes to various levels of dietary calcium soaps of fatty acids,
Animal Feed Science and Technology, Volume 131, Issues 3-4, Special Issue: Modifying Milk Composition, 15 December 2006, Pages 312-332, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.06.014.
(http://www.sciencedirect.com/science/article/B6T42-4KGPPDB-5/2/198bc47aa144491f15c3bc938a161e87)

Abstract:

Two experiments were completed to assess lactational effects of feeding calcium soaps of fatty acids (CSFA) to lactating sheep. In the first experiment, 50 Manchega ewes were blocked into groups of 10 to which the treatments were applied. Ewes grazed and were supplemented indoors with hay and a concentrate. Treatments consisted of different levels of CSFA in the concentrate, being: control, 50, 100, 150 or 200 g CSFA/kg as fed. Concentrates were fed individually at fixed amounts depending on lactation period: nursing (weeks 1-4; 1.0 kg/day), and early (weeks 5-7; 1.0 kg/day), mid (weeks 8-14; 0.8 kg/day) and late milking (weeks 15-21; 0.6 kg/day). Level of CSFA did not affect milk yield, and effects on milk composition varied by lacation period. The biggest effects occurred during nursing, when milk fat content ($P<0.05$) and yield ($P<0.001$), as well as milk total solids content ($P<0.001$) and yield ($P<0.05$), increased linearly with CSFA dose. Milk fat content increased at a decreasing rate (linear and quadratic $P<0.05$) with CSFA dose during milking, but milk protein content decreased ($P<0.05$) linearly in mid and late ($P<0.01$) lactation. Relative milk fat yield response to CSFA fat was bigger ($P<0.01$) during nursing than in milking (55% and 20%, respectively) and decreased linearly ($P<0.001$) with increasing CSFA feeding at the end of lactation. Findings from the first experiment were applied in a second experiment to the total mixed ration of a flock of 94 Manchega ewes. Treatments consisted of control and CSFA added (42 g CSFA/kg DM) total mixed rations. Diets were compared during mid lactation (weeks 7-16) by using a switch-back design of three periods of 20 days each (1, control; 2, CSFA; 3, control). Contents of milk fat and milk total solids, as well as their yields, increased ($P<0.05$) in the CSFA diet, but milk protein did not vary. Milk from CSFA fed ewes had less saturated fatty acids (FA) and more monounsaturated FA than the control. The C14:1/C14:0 [Delta]9-desaturase index was not modified by CSFA. Overall, feeding CSFA to dairy ewes increased milk fat content and modified the FA profile of milk fat. Although FA from dietary CSFA were efficiently transferred to milk at the beginning of lactation, use of moderate amounts of CSFA is recommended,

particularly at the end of lactation in order to avoid negative effects on milk protein concentration.
Keywords: Lipids; Fat; Calcium soaps; Palm oil; Milk composition; Sheep

U.J. Schroder, R. Staufenbiel, Invited Review: Methods to Determine Body Fat Reserves in the Dairy Cow with Special Regard to Ultrasonographic Measurement of Backfat Thickness,
Journal of Dairy Science, Volume 89, Issue 1, January 2006, Pages 1-14, ISSN 0022-0302, DOI: 10.3168/jds.S0022-0302(06)72064-1.
(http://www.sciencedirect.com/science/article/B9887-4YJ4CWM-1/2/dfab6a57af3492ace49a7346123bb397)
Abstract:
As the dairy cow uses body energy reserves in early lactation, body condition scoring has become an integral part of dairy herd management. Several methods based on visual and tactile evaluation have been developed. Problems caused by the subjectivity of these techniques have been reported. Alternative approaches to predict energy reserves or energy balance in dairy cattle include metabolic profiling and measurement of live weight, heart girth, or skinfold thickness. A less common method to assess fat reserves in body tissues is measuring backfat thickness (BFT) by using ultrasound. An ultrasound technique has been established to predict carcass quality in beef cattle. A new aspect is the application of ultrasound as a monitoring tool in dairy herd management where another location has to be evaluated. This technique has been validated by relating BFT to total body fat (TBF) content and carcass BFT. Backfat thickness also has been related to other methods of body condition scoring. Target values for the development of BFT throughout lactation are available. The relationship between BFT and TBF content is highly significant although biased by multiple factors. A change in BFT of 1 mm equates to approximately 5 kg of TBF content. Measuring BFT by ultrasound is of added value compared with other body condition scoring systems because it is objective and precise. Changes in body condition can be detected and evaluated properly.
Keywords: body condition; ultrasonography; backfat thickness; dairy herd management

Gauri S. Mittal, Treatment of wastewater from abattoirs before land application--a review,
Bioresource Technology, Volume 97, Issue 9, June 2006, Pages 1119-1135, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.11.021.
(http://www.sciencedirect.com/science/article/B6V24-4FDNBTG-4/2/80fd3e2d44ac9ec2cc598bdc26baca4e)
Abstract:
Pre-treatments are screening, catch basins, flotation, equalization, and settlers for recovering proteins and fats from abattoir wastewater. With chemical addition, dissolved air flotation (DAF) units can achieve chemical oxygen demand (COD) reductions ranging from 32% to 90% and are capable of removing large amounts of nutrients. Aerobic trickling towers reduced soluble COD by additional 27% but did not reduced total COD. Chemical-DAF reduced 67% of total COD and soluble COD. About 40-60%

of the solids or approximately 25-35% of the biological oxygen demand (BOD) load can be separated by pre-treatment screening and sedimentation. Anaerobic systems are lagoon, anaerobic contact (AC), up-flow anaerobic sludge blanket (UASB), anaerobic sequence batch reactor (ASBR), and anaerobic filter (AF) processes. Abattoir wastewater is well suited to anaerobic treatment because it is high in organic compounds. Typical reductions of up to 97% BOD, 95% SS and 96% COD are reported. UASB's average COD removal efficiencies are of 80-85%. UASB seems to be a suitable process for the treatment of abattoir wastewater, due to its ability to maintain a sufficient amount of viable sludge. Wastewater in abattoirs can be reduced by treatment of immersion chiller effluent by membrane filtration which can produce recyclable water. Total organic C can be reduced below 100 mg/L, and bacteria can not pass through the membrane pores. The abattoir waste minimization options are also discussed.

Keywords: Abattoir; Smokehouse; Wastewater; Treatment; Land application; Land spreading

Natasa Atanasova, Ljupco Todorovski, Saso Dzeroski, Boris Kompare, Constructing a library of domain knowledge for automated modelling of aquatic ecosystems, Ecological Modelling, Volume 194, Issues 1-3, Special Issue on the Fourth European Conference on Ecological Modelling - Selected Papers from the Fourth European Conference on ***Ecological Modelling***, September 27 - October 1, 2004, Bled, Slovenia, 25 March 2006, Pages 14-36, ISSN 0304-3800, DOI: 10.1016/j.ecolmodel.2005.10.002.
(http://www.sciencedirect.com/science/article/B6VBS-4HR75R1-1/2/67a227faf531f9dfdf4790453ad6c7ca)

Abstract:
Conceptual mathematical modelling of aquatic ecosystems comprises a considerable amount of knowledge reflected through a vast variety of different models that can be found in literature. While there is a growing interest in developing unifying documentation systems that allow storage of these models, not much work has been done yet on formalization and storage of the modelling knowledge itself. Such formalization would allow for better sharing and exchange of knowledge between experts on one hand and make it available to computational methods for modeling on the other. The knowledge library we develop here covers the knowledge in the domain of food web modelling in lakes based on differential equations. We illustrate the generality of the knowledge in the library through reconstruction of three well-known models of different complexity from the library, i.e. [Vollenweider, R.A., The Scientific Basis of Lake and Stream Eutrophication with Particular Reference to Phosphorus and Nitrogen as Eutrophication Factors. Organisation for Economic Cooperation and Development, Paris, 1968; Imboden, D., Phosphorus model of lake eutrophication. Limnol. Oceanogr. 19 (1974) 297-304] and SALMO model [Bendorf, J., A contribution to the phosphorus loading concept. Int. Revue ges. Hydrobiol. 64 (2) (1979) 177-188; Recknagel, F., Systemtechnische Prozedur zur Modellierung und Simulation von Eutrophierungs-prozessen in stehenden und gestauten Gewassern: Sektion Wasserwesen, TU Dresden, Dresden, 1980]. We also illustrate how computational methods for model induction from data can benefit from the developed library of knowledge.

Keywords: Aquatic ecosystem; Dynamic systems; Automated modelling; Computational scientific discovery; Knowledge representation

M.R. Maleki, J.F. Jafari, M.H. Raufat, A.M. Mouazen, J. De Baerdemaeker, Evaluation of Seed Distribution Uniformity of a Multi-flight Auger as a Grain Drill Metering Device, ***Biosystems Engineering,*** Volume 94, Issue 4, August 2006, Pages 535-543, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2006.04.003.
(http://www.sciencedirect.com/science/article/B6WXV-4K7WJ9N-1/2/716e394ac3361fe9cc5f723f0d7f8aa0)

Abstract:
The study of fluted-roller seed meter, the commonly used feeding device on grain drills, revealed that the seed metering uniformity is impaired due to sudden release of seed batches. The use of multi-flight screws (augers) as a seed metering and feeding device for grain drills was studied. As preliminary test, 12 multi-flight auger configurations were designed and evaluated for seed spacing at three travel speeds. The uniformity of seed distribution was evaluated by a laboratory method using the coefficient of uniformity. The different auger configurations studied are the auger groove depth and width, number of flights, auger outer diameter and rotational speed.
Results indicated that different auger characteristics have significant effects on seed uniformity discharge from the feed units. In general, the uniformity tended to increase with increasing auger outer diameter, depth and width of grooves, number of auger flights and rotational speed. Based on the results of the preliminary test, two extra augers were designed and developed. The first auger was 50 mm in diameter with seven flights and a 10 mm groove depth and width (A5), while the second one was 70 mm in diameter with seven flights and a 14 mm groove depth and width (B5). The performance of these augers was evaluated and compared to that of fluted-roller feed device. The coefficient of uniformity was calculated at three different travel speeds of 2[middle dot]86, 4[middle dot]78, and 6[middle dot]61 km h-1. The coefficient of uniformity of augers was mostly higher than those for the fluted-roller metering device. The auger coefficient of uniformity was significantly higher than those for the fluted-roller meter at lower speeds. However, there was not any significant difference at higher speeds between the feed units tested. The coefficient of uniformity, over all speeds, for the fluted-roller, auger A5 and auger B5 were 0[middle dot]89, 0[middle dot]91 and 0[middle dot]92, respectively.

M.G. Keane, M.J. Drennan, A.P. Moloney, Comparison of supplementary concentrate levels with grass silage, separate or total mixed ration feeding, and duration of finishing in beef steers,
Livestock Science, Volume 103, Issues 1-2, August 2006, Pages 169-180, ISSN 1871-1413, DOI: 10.1016/j.livsci.2006.02.008.
(http://www.sciencedirect.com/science/article/B7XNX-4JRKJM0-2/2/10f251767489ce4a7bace8d33474af93)

Abstract:
Winter finishing of beef cattle is expensive so feed costs per kg carcass gain must be minimised. The objectives of this study with finishing beef steers were (1) to determine the production responses to varying levels of supplementary concentrates with grass

silage, (2) to compare the effects of feeding silage and concentrates separately or as a total mixed ration (TMR), and (3) to compare short (S) and long (L) finishing periods. A total of 117 finishing steers were blocked on weight and assigned to 13 groups of 9 animals each comprising a pre-experimental slaughter group and 12 finishing groups arranged in a 6 (feeding treatments) x 2 (durations of finishing) factorial experiment. The 6 feeding treatments were: (1) silage only offered ad libitum (SO), (2) SO plus a low level of concentrates offered separately (LS), (3) SO plus a low level of concentrates offered as a TMR (LM), (4) SO plus a high level of concentrates offered separately (HS), (5) SO plus a high level of concentrates offered as a TMR (HM), and (6) concentrates ad libitum plus restricted silage (AL). Target low and high concentrate levels were proportionately 0.375 and 0.750 of daily dry matter (DM) intake, respectively. S and L finishing periods were 105 and 175 days, respectively. Silage DM intake decreased ($P < 0.001$) and total DM intake increased ($P < 0.001$) with increasing concentrate level. Maximum DM intake occurred at the high concentrate level but maximum net energy intake occurred on ad libitum concentrates. Live weight gains for SO, LS, LM, HS, HM and AL were 212, 900, 929, 1111, 1089 and 1207 (S.E. 46.2) g/day, respectively. Corresponding carcass weight gains were 119, 506, 540, 662, 633 and 746 (S.E. 25.4) g/day. Kill-out proportion, carcass conformation score and all measures of fatness increased significantly with increasing concentrate level. Feeding a TMR increased silage intake at the low concentrate level but otherwise had no effect on overall animal performance or carcass traits. Extending the finishing period reduced ($P < 0.001$) daily live weight gain, but the associated reduction in carcass weight gain was not statistically significant. It is concluded that the response to supplementary concentrates decreased with increasing level, there was no animal production advantage to a TMR over separate feeding of the dietary constituents, and extending the duration of the finishing period reduced mean daily live weight gain and increased fatness.

Keywords: Beef cattle; Concentrate supplementation; Total mixed ration; Winter finishing

Giuseppe Pulina, Anna Nudda, Gianni Battacone, Antonello Cannas, Effects of nutrition on the contents of fat, protein, somatic cells, aromatic compounds, and undesirable substances in sheep milk,

Animal Feed Science and Technology, Volume 131, Issues 3-4, Special Issue: Modifying Milk Composition, 15 December 2006, Pages 255-291, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.05.023.
(http://www.sciencedirect.com/science/article/B6T42-4KGPPDB-3/2/37f425b98be1217103b8e6b093f610f2)

Abstract:

This review discusses current knowledge of the main nutritional factors that influence composition of sheep milk and, consequently, its processing into cheese, with special focus on milk fat and protein concentration and characteristics, content of bioactive compounds, somatic cell content, content of aromatic compounds able to improve its organoleptic characteristics and content of toxic substances. Sheep milk composition is strongly influenced by ewe nutrition, especially in highly productive animals. Milk fat concentration is markedly affected by the ewe's net energy (NE) balance, dietary NDF

content and dietary supplementation with ruminally protected/inert or unprotected marine and vegetable oils. Milk fat composition can be modified to contain higher levels of human healthy fatty acids (FA), such as conjugated linoleic acid and omega-3 FA. Milk protein content, and its characteristics, are more difficult to change than milk fat, although dietary energy seems to have a major role, while diet protein and amino acid supplementation only marginally affect milk protein level and its characteristics. Nutritional stress, and some vitamins, affect the somatic cell content of milk and this impacts cheese yield and quality. Feeds in the diet can markedly influence milk aroma and, consequently, play a role in determining cheese flavor, especially when ewes are pastured. Possible sources and causes of contamination of sheep milk by heavy metals or dioxins, and mycotoxins, through the diet are also addressed. Overall, quality and safety of sheep milk can be modified and improved by the nutrition characteristics of the diet.

Keywords: Nutrition; Milk quality; Sheep

S.V. Rama Rao, M.V.L.N. Raju, M.R. Reddy, P. Pavani, Interaction between dietary calcium and non-phytate phosphorus levels on growth, bone mineralization and mineral excretion in commercial broilers,

Animal Feed Science and Technology, Volume 131, Issues 1-2, 15 November 2006, Pages 135-150, ISSN 0377-8401, DOI: 10.1016/j.anifeedsci.2006.02.011.
(http://www.sciencedirect.com/science/article/B6T42-4JJGB70-2/2/eaf8731d1c2b38d51b4a3397b02e5c01)

Abstract:
An experiment was conducted to study the interaction between the levels of dietary calcium (Ca) and non-phytate phosphorus (NPP) on growth, bone mineralization and mineral excretion in commercial broilers. Day-old Vencob female broiler chicks (n = 720) were distributed into 144 stainless steel battery brooders, five birds in each. Four levels each of Ca (6, 7, 8 and 9 g kg-1) and NPP (3, 3.5, 4 and 4.5 g kg-1) were fed in a factorial design through a maize-soya basal diet. Levels of maize, dicalcium phosphate and oyster shell powder were adjusted to obtain the desired levels of Ca and NPP. Each diet was fed ad libitum to chicks in 9 battery brooders from day 1 to 42 days of age. Body weight gain, feed intake and tibia breaking strength were depressed (P<=0.01) and leg abnormality score increased with increase in level of Ca at lower levels of NPP (3 and 3.5 g kg-1 diet) at 14, 28 and 42 days of age. These ill effects were alleviated by reducing the levels of Ca to the minimum levels tested. Tibia breaking strength and tibia ash content in broilers fed the lowest levels of Ca and NPP (6 and 3 g kg-1, respectively) were similar to those fed diets with highest level of these minerals (9 and 4.5 g kg-1, respectively) in diet. Excretion of Ca, P and Fe was lower in broilers fed the lowest levels of minerals (6 g Ca and 3 g NPP kg-1) compared to the higher levels. The requirements of Ca and NPP for performance and bone mineralization were predicted using surface regression analysis. Increase in the level of Ca and NPP above the minimum levels tested did not further improve the variables studied. Based on the data, it could be concluded that levels of 6 g Ca and 3.75 g NPP kg-1 diet would be adequate for commercial broilers from day 1 to 42 days of age.

Keywords: Calcium; Non-phytate phosphorus; Weight gain; Bone mineralization; Mineral excretion

Stephanie L. Lansing, Jay F. Martin, Use of an ecological treatment system (ETS) for removal of nutrients from dairy wastewater, Ecological Engineering, Volume 28, Issue 3, The Growth of
Ecological Engineering: The Fifth AnnualConference of the American Ecological Engineering Society, 1 December 2006, Pages 235-245, ISSN 0925-8574, DOI: 10.1016/j.ecoleng.2006.04.006.
(http://www.sciencedirect.com/science/article/B6VFB-4K66F01-2/2/526140ec2146fe534d7494ee32ccb554)

Abstract:
Ecological Treatment Systems (ETS) are composed of a series of anaerobic and aerobic reactors, clarifiers, and wetlands, and have been used for the removal of nutrients from municipal and industrial wastewaters. The design of ETS enhances nutrient removal by providing both aerobic and anaerobic environments and steep gradients between the two environments. The ability of an ETS to treat wastewater from a dairy farm was investigated with a 20-week study in Columbus, OH, USA.
The Waterman Ecological Treatment System (WETS) had four replicate treatment lines. Together, the four lines treated 1310 L/day of diluted wastewater from a dairy facility with over 99% removal of ammonium-nitrogen (NH4-N) and carbonaceous biochemical oxygen demand (CBOD), and 79% removal of orthophosphate (PO4-P). The average influent/effluent concentrations of NH4-N, CBOD, and PO4-P were 52.1/0.07 mg/L, 517/5.2 mg O2/L, and 21.0/4.4 mg/L, respectively. Nitrate + nitrite (NOx-N) was produced and removed within the system, and had an average effluent concentration of 0.53 mg/L. The multiple anaerobic-aerobic interfaces in the WETS design enhanced biological removal of nitrogen and phosphorus. NH4-N, CBOD, and NOx-N were consistently removed throughout the 20-week study, but PO4-P removal efficiency decreased over time in one of the four treatment lines.
Keywords: Living Machine; Nitrogen; Nitrification; Denitrification; Phosphorus; Constructed wetlands

Samarthia Thankappan, Peter Midmore, Tim Jenkins, Conserving energy in smallholder agriculture: A multi-objective programming case-study of northwest India,
Ecological Economics, Volume 56, Issue 2, 15 February 2006, Pages 190-208, ISSN 0921-8009, DOI: 10.1016/j.ecolecon.2005.01.017.
(http://www.sciencedirect.com/science/article/B6VDY-4G361KF-1/2/8e320a4b8fbfb85b9289deb2a4d42825)

Abstract:
In semi-arid conditions in Northwest India, smallholder agriculture has made increasing use of subsidised mechanisation and energy inputs to reduce short-term risks. However, detrimental environmental consequences have occurred, not least a rapidly falling water table, and energy-intensive production is threatened by the prospect of increasing scarcity and expense of energy supplies, especially as urban demands are forecast to grow rapidly. This paper describes the energy flows through four subsystems of smallholder agricultural villages: the crop system; non-crop land uses; livestock systems; and households. It employs a multi-objective programming model to demonstrate choices available for maximands either of net solar energy capture or financial surpluses. Applied to three villages selected to represent major settlement

types in the Saurashtra region of Gujarat, the results demonstrate that both energy conservation and financial performance can be improved. Although these results need qualifying because of the reductionist, linear character of the model used, they do provide important insights into the cultural role of mechanisation and the influence of traditional agricultural practices. They also underline the need for local energy conservation strategies as part of an overall approach to improved self-determination in progress towards rural sustainability.
Keywords: Energy conservation; Smallholder agriculture; Optimising model; India

Yi-Chich Chiu, Din-Sue Fon, Gang-Jhy Wu, Development of an Automatic Pallet Handling System for Seeded Trays,
Biosystems Engineering, Volume 93, Issue 2, February 2006, Pages 123-138, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2005.12.001.
(http://www.sciencedirect.com/science/article/B6WXV-4J5565F-5/2/3782db529229f726f6201e518f3a06ba)
Abstract:
The objective of this study was to develop an automatic pallet loading and unloading system for rice seeded trays, that receives three seeded trays in a stack from an automatic sowing line and arranges them orderly on a pallet. The loaded pallets will then be shipped out to a conditioning room for sprouting. The system can also reverse the former procedures to retrieve sprouted trays from pallets and arrange the trays to be sent to the nursery field, where the seeds in the tray keep growing to the seedling stage. A prototype was designed, constructed and subjected to performance testing and evaluation. Experimental results showed that the system worked satisfactorily at stacking 1416 trays h-1, with 95% pallet loading success rate. The unloading capacity was 1380 trays h-1, with 97[middle dot]2% success rate.

Nicolas Korsak, Jean-Noel Degeye, Gregory Etienne, Jean-Marie Beduin, Bernard China, Yasmine Ghafir, Georges Daube, Use of a serological approach for prediction of Salmonella status in an integrated pig production system,
International Journal of Food Microbiology, Volume 108, Issue 2, 25 April 2006, Pages 246-254, ISSN 0168-1605, DOI: 10.1016/j.ijfoodmicro.2005.09.013.
(http://www.sciencedirect.com/science/article/B6T7K-4J7H3XY-1/2/470b1d700aac50b7071e899916e21bb9)
Abstract:
Relevance of a Salmonella serological detection technique was studied from complete results obtained from 9 pigs fattening units. Feces and overshoes were sampled at different periods after starting fattening (2, 3 and 4 months) while caecal contents were taken on the slaughter line. The bacteriological technique used was based on a Diasalm enrichment and a commercial test was used for serology on an average of ten animals per batch. The aim of this work was to establish a correlation between serological results obtained at slaughter (10 samples/batch) and bacteriological results. In this context, two types of logistic regression models were tested by considering alternatively serology and Salmonella detection in caecal contents as the dependent variables. Firstly, beside the fact that all logistic regression models show weak correlations, the first finding was that positive results in overshoes taken at 2 and 3 months are slightly

correlated with serological status of herds (odds-ratios of 4.96 and 2.55). Secondly, when batches were characterized as positive on the basis of serological results, the probability of Salmonella recovery in caecal contents was higher than when the batches were considered as negative (odds-ratios comprised between 4.36 and 5.81).
A major conclusion is that serology can be used to follow the improvement of an integrated pig production system, but is not the unique solution for assessing risk of Salmonella shedding from specific herds.
Keywords: Salmonella; Swine; Pigs; Serology; Logistic regression models; Caecal contents

T.E. Grift, G. Kweon, J.W. Hofstee, E. Piron, S. Villette, Dynamic Friction Coefficient Measurement of Granular Fertiliser Particles,
Biosystems Engineering, Volume 95, Issue 4, December 2006, Pages 507-515, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2006.08.006.
(http://www.sciencedirect.com/science/article/B6WXV-4M3RP7C-2/2/eff3b6e479e1084eef9b5dc51c6aadc5)
Abstract:
Theoretically, in the absence of friction, when a particle is sliding along a straight radial vane, mounted on a flat disc which is spinning at a constant rotational velocity, its radial and tangential velocity are equal at any point along the vane. In reality, there are disturbances causing a difference between the radial and tangential velocities, such as drop mechanics, mechanical (Coulomb) friction, aerodynamic effects, as well as particle bouncing effects against the vane and other particles. These factors were lumped together and termed the `friction coefficient'.
The tangential particle velocity at the discharge point was assumed constant, since the particle was assumed in direct contact with the vane until emanation. The radial particle velocity was measured at a distance of 0[middle dot]4 m from the disc edge with an optical sensor developed in earlier research. A theoretical analysis was used to obtain equations that allowed determination of the mechanical friction coefficient of individual particles, based on the measured radial velocity and the assumed constant tangential velocity.
For experiments, a commercial single disc spreader fitted with a flat disc and straight radial vanes was used. The results for urea fertiliser showed a near-Gaussian distribution of the friction coefficients, with a mean value of 0[middle dot]36 and a standard deviation of 0[middle dot]1 among 812 measurements. In addition, an inversely proportional relationship was found between the friction coefficients and the particle diameters.

S.H. Choi, Y.H. Choy, Y.K. Kim, S.N. Hur, Effects of feeding browses on growth and meat quality of Korean Black Goats,
Small Ruminant Research, Volume 65, Issue 3, October 2006, Pages 193-199, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2005.04.031.
(http://www.sciencedirect.com/science/article/B6TC5-4GTW8W6-1/2/d51baa3b4197b87001d6bfaa0c45be5b)

Abstract:
Effects of feeding browses on growth and meat quality of Korean Black Goats were investigated. Twenty-eight bucks were divided in equal numbers into four treatment groups and fed fibrous diets of oak browse, pine browse, fermented pine browse or rice straw each with concentrate supplement. Metabolic profile, growth rate, feed intake, carcass yield, meat quality and serum were investigated. Average daily gains of bucks were 45.3 g for oak browse, 36.4 g for rice straw, 28.1 g for pine browse and 30.0 g for fermented pine browse. Daily forage intake per goat was 197 g DM for oak browse, which was higher than those for the other diets. Bucks fed fermented pine browse ate only 74 g forage per day. Body metabolism was normal with all sources of browses from the results of serological inspection. Dressing percentage was 45.1-46.2%. Meat percentage was 55.2-55.9% and fat percentage was 7.31% for oak browse which was lower than those for pine browse and fermented pine browse. Shear force of goat meat was 4.11-5.11 kg/cm2 for browses and 6.30 kg/cm2 for rice straw. Cooking loss was 29.6% for pine browse which was lower than the others. Juiciness, tenderness and flavor of the goat meat were the best for the fermented pine browse followed by other browses and rice straw.
Keywords: Browses; Daily gain; Meat quality; Serum composition; Korean Black Goat

Jason Bailey, Anders Alanara, Mapping the demand-feeding pattern of hatchery-reared rainbow trout, Oncorhynchus mykiss (Walbaum),
Aquaculture, Volume 254, Issues 1-4, 28 April 2006, Pages 355-360, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2005.09.027.
(http://www.sciencedirect.com/science/article/B6T4D-4HK5SJB-1/2/e9538fc23eeb2f2ad2b13a7ab4d243c1)

Abstract:
Fish fed using demand feeders often display highly variable feeding activity across days. In order to quantify this pattern, data from 10 groups of self-feeding rainbow trout, Oncorhynchus mykiss (Walbaum), with a mean start weight of 30-120 g were examined for repeating patterns using time series analysis. The number of bites on a self-feeding trigger were recorded and summarised on both an hourly and daily basis. Significant peaks in trigger-biting activity occurred in the morning and evening at lights on and lights off. It is suggested that this activity pattern corresponds to an evolutionary trade-off between predation risk and feed availability. Across days, peaks in trigger-biting activity are significantly higher every second day. A possible explanation for this pattern is the time required for gastric evacuation and the return of appetite.
Keywords: Time series; Behavioural patterns; Self-feeding activity; Rainbow trout; Oncorhynchus mykiss; Appetite

F.J. Lobo, L.M. Fernandez-Salas, I. Moreno, J.L. Sanz, A. Maldonado, The sea-floor morphology of a Mediterranean shelf fed by small rivers, northern Alboran Sea margin, ***Continental Shelf Research,*** Volume 26, Issue 20, December 2006, Pages 2607-2628, ISSN 0278-4343, DOI: 10.1016/j.csr.2006.08.006.
(http://www.sciencedirect.com/science/article/B6VBJ-4M2WP97-1/2/87035eeb6414d4c22d79f713381bb63e)

Abstract:
Depositional geometries and distribution patterns of shelf sediment wedges mainly derived from small rivers located in the northern margin of the Alboran Sea, Western Mediterranean Basin, are reported in this study, in order to understand: (1) their generation under particular physiographic and climatic conditions of river basins; (2) the interaction of shallow-water wedges with submarine valleys. A high amount of data has been used in this study, including river discharge and wave climate data, multibeam bathymetry, high-resolution seismic profiles and surficial sediment samples.
The eastern shelf of the study area comprises the prodeltaic wedge off the Guadalfeo River and its eastward continuation, interrupted by the deeply indented Carchuna Canyon head. In contrast, the western shelf receives the contributions of a smaller river, the Verde River, whose associated prodeltaic wedge is limited to the inner shelf. Morphological features of both prodeltas are similar and differ from other Mediterranean prodeltaic bodies, resembling fan deltas. Those similarities include very steep foresets and bottomsets, very shallow and close to the coast offlap break, coarse sediment composition, lobate shape and common occurrence of crenulated sea floor. All these features point out to an origin linked to the activity of high-density sediment flows, rapid sedimentation and limited lateral redistribution. Those processes are favoured by the existence of an abrupt onshore physiography, a regional climate with a marked seasonality that conditioned torrential fluvial regimes and high availability of loose sand and gravel.
Shelf sediment by-pass is a likely process during the Holocene in the eastern shelf, as suggested by the identification of two types of submarine valleys: (1) numerous gullies occur from the distal toe of the Guadalfeo River prodelta to the slope; (2) submarine canyon heads affect to the Holocene sedimentary wedge in the eastern sector of the study area. In the western shelf, however, the influence of shelf sedimentation processes on deeper domains is minimal, due to shelf widening, prevalence of relict features and absence of submarine valleys.

Keywords: Alboran Sea; Continental shelf; Submarine geomorphology; Prodeltaic wedges; Sediment transfer

R.M. Kirkland, D.C. Patterson, The effect of quality of grass and maize silage on the intake and performance of beef cattle***,***
Livestock Science, Volume 100, Issues 2-3, April 2006, Pages 179-188, ISSN 1871-1413, DOI: 10.1016/j.livprodsci.2005.08.015.
(http://www.sciencedirect.com/science/article/B7XNX-4JMKVM1-F/2/51b92b17b5b718faf38844d96a0cab72)

Abstract:
A study was undertaken to evaluate the effects of incorporating high (HMS) and low (LMS) maturity maize silages into diets based on low (LGS) and high (HGS) feed value

grass silages offered to beef cattle. Seventy-two continental cross-bred steers were used in a 14-week continuous design, randomised block experiment. The six treatments were arranged as a 2 x 3 factorial design incorporating the LGS and HGS offered as the sole forage, along with each of the two grass silages offered in a 60:40 ratio (DM basis) with the HMS and LMS. All diets were supplemented with 3 kg/head/day concentrates. Total daily DM and metabolisable energy intakes were higher ($P < 0.001$) for diets based on HGS compared to those based on LGS. Intakes were similar ($P > 0.05$) between diets containing LMS and HMS, both of which were higher ($P < 0.001$) than diets containing grass silage as the sole forage. Highest DM intakes were recorded with a mixture of HGS and HMS ($P < 0.05$ or greater). Cattle offered diets containing HGS had higher live-weight gain ($P < 0.05$), final live weight, carcass gain and carcass weight ($P < 0.001$) than those offered diets containing LGS. Feed conversion efficiency, assessed on a carcass gain basis, was poorer ($P < 0.05$) with diets containing LGS compared with those containing HGS, though differences between diets containing either LMS or HMS and GS as the sole forage were not significant ($P > 0.05$).

Keywords: Grass silage; Maize silage; Intake; Beef cattle; Animal performance

Georges Choubert, Maria Manuela Mendes-Pinto, Rui Morais, Pigmenting efficacy of astaxanthin fed to rainbow trout Oncorhynchus mykiss: Effect of dietary astaxanthin and lipid sources,

Aquaculture, Volume 257, Issues 1-4, 30 June 2006, Pages 429-436, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2006.02.055.
(http://www.sciencedirect.com/science/article/B6T4D-4JCSHSD-1/2/9498ed4b908a5cb27313741fefb19972)

Abstract:
The aim of the present experiment was to investigate the effect of two different dietary types of oil (fish oil (FI) and olive oil (OL)) on the pigmenting efficacy of astaxanthin from the green micro-algae Haematococcus pluvialis (ALG) (total amount of carotenoid pigments 32 mg kg- 1 on a dry weight basis of which astaxanthin accounted for 98.6%) and from the synthetic astaxanthin (AST) in terms of astaxanthin serum concentration, induced muscle colour, and astaxanthin muscle retention in rainbow trout for 6 weeks. Diets with different oil sources were well accepted by fish. At the end of the experiment there were no significant differences between fish fed different diets in final mean weight, specific growth rate, or feed conversion ratio. Fish fed AST showed higher ($P < 0.05$) serum concentrations than those fed ALG. Moreover fish fed diets OL displayed higher ($P < 0.05$) serum astaxanthin levels than those fed diets FI. Fish muscle colour parameters reacted differently according to fish feed. Over 6 weeks of feeding L* compared to L* of initial sampling time showed a decrease more marked for trout fed ASTFI than ALGFI. Fish fed ASTOL and ALGOL displayed intermediary values. On the contrary the other colour parameters increased except hue H([degree sign])ab which did not show any change whatever diet was fed to the fish. Chroma C*, a*, and b* data obtained for fish fed AST were higher than those obtained for fish fed ALG. Muscle astaxanthin concentrations were lower ($P < 0.05$) for fish fed algae than for those fed synthetic astaxanthin. After 6 weeks of experiment muscle astaxanthin levels were not different ($P > 0.05$) for fish fed olive or fish oil. Muscle astaxanthin retention was higher ($P < 0.05$) for fish fed AST than for fish fed ALG.

Keywords: Astaxanthin; Haematococcus pluvialis; Fish oil; Olive oil; Pigmentation; Trout

H. Kerem Cigizoglu, Ozgur Kisi, Methods to improve the neural network performance in suspended sediment estimation,
Journal of Hydrology, Volume 317, Issues 3-4, 20 February 2006, Pages 221-238, ISSN 0022-1694, DOI: 10.1016/j.jhydrol.2005.05.019.
(http://www.sciencedirect.com/science/article/B6V6C-4GKWB49-2/2/5eb19cc062475638f9108bbf176232d3)
Abstract:
The effect of employment of different methods of suspended sediment estimation by artificial neural networks (ANNs) was the concern of the presented study. It was seen that the initial statistical analysis of flow and sediment data provided valuable information about the appropriate number of input nodes of the neural network, thereby avoiding redundant nodes. The k-fold partitioning of the training data set showed that similar or even superior sediment estimation performances can be obtained with quite limited data provided that the training data statistics of the subset are close to those of the testing data. The range-dependent neural network (RDNN) was found to be superior to conventional ANN applications, where only a single network is trained considering the entire training data set. It was seen that both low and high-observed sediment values were closely approximated by the RDNN.
Keywords: Range-dependent neural networks; k-fold partitioning; Suspended sediment; River flow

Cheng-Jin Du, Da-Wen Sun, Learning techniques used in computer vision for food quality evaluation: a review,
Journal of Food Engineering, Volume 72, Issue 1, January 2006, Pages 39-55, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2004.11.017.
(http://www.sciencedirect.com/science/article/B6T8J-4F60NCC-3/2/9104e5f21bde0889b8647addab9ce35b)
Abstract:
Learning techniques have been applied increasingly for food quality evaluation using computer vision in recent years. This paper reviews recent advances in learning techniques for food quality evaluation using computer vision, which include artificial neural network, statistical learning, fuzzy logic, genetic algorithm, and decision tree. Artificial neural network (ANN) and statistical learning (SL) remain the primary learning methods in the field of computer vision for food quality evaluation. Among the applications of learning algorithms in computer vision for food quality evaluation, most of them are for classification and prediction, however, there are also some for image segmentation and feature selection. In this paper, the promise of learning techniques for food quality evaluation using computer vision is demonstrated, and some issues which need to be resolved or investigated further to expedite the application of learning algorithms are also discussed.
Keywords: ANN; Classification; Computer vision; Decision tree; Feature selection; Food; Fuzzy logic; Genetic algorithm; Image segmentation; Learning; Prediction; Quality evaluation; SL

H. Fredriksson, A. Baky, S. Bernesson, A. Nordberg, O. Noren, P.-A. Hansson, Use of on-farm produced biofuels on organic farms - Evaluation of energy balances and environmental loads for three possible fuels,
Agricultural Systems, Volume 89, Issue 1, July 2006, Pages 184-203, ISSN 0308-521X, DOI: 10.1016/j.agsy.2005.08.009.
(http://www.sciencedirect.com/science/article/B6T3W-4H8MP61-1/2/45e167e6a2db1bc5f3db7733da5dd3ee)

Abstract:
The aim of this work was to evaluate systems making organic farms self-sufficient in farm-produced bio-based fuels. The energy balance and environmental load for systems based on rape methyl ester (RME), ethanol and biogas were evaluated using a life cycle perspective. Complete LCAs were not performed. Important constraints when implementing the systems in practice were also identified.
The RME scenario showed favourable energy balance and produced valuable by-products but was less positive in some other aspects. The use of land was high and thereby also the emissions associated with cultivation. Emissions, with the exception of CO2, during utilisation of the fuel were high compared to those of the other fuels in the study. The technology for production and use of RME is well known and easy to implement at farm scale.
The production of ethanol was energy consuming and the by-products were relatively low value. However, the area needed for cultivation of raw material was low compared to the RME scenario. The production and utilisation of ignition improver and denaturants were associated with considerable emissions. Suitable ethanol production technology is available but is more optimal for large scale systems.
The biogas scenario had a low relative need for arable land, which also resulted in smaller soil emissions to air and water. Another advantage was the potential to recycle plant nutrients. On the other hand, the potential emissions of methane from storage of digestate, upgrading of biogas and methane losses during utilisation of fuel produced a negative impact, mainly on global warming. Small scale technology for biogas cleaning and storage is not fully developed and extensive tractor modifications are necessary.
The global warming effects of all three systems studied were reduced by 58-72% in comparison to a similar farming system based on diesel fuel. However, the fuel costs were higher for all scenarios studied compared to current diesel prices. In particular, the large costs for seasonal storage of gas meant that the biogas scenario described is currently not financially viable.
Keywords: Organic farming; RME; Ethanol; Biogas; Biofuel; Life cycle perspective

J. Christopher Young, Honghui Zhu, Ting Zhou, Degradation of trichothecene mycotoxins by aqueous ozone,
Food and Chemical Toxicology, Volume 44, Issue 3, March 2006, Pages 417-424, ISSN 0278-6915, DOI: 10.1016/j.fct.2005.08.015.
(http://www.sciencedirect.com/science/article/B6T6P-4H5MYVN-1/2/747b1da4430089b6d3448753775dc3c1)

Abstract:
The degradation of ten trichothecene mycotoxins by aqueous ozone was monitored by liquid chromatography-ultraviolet-mass spectrometry (LC-UV-MS). Saturated aqueous ozone (~25 ppm) degraded these mycotoxins to materials that were not detected by UV or MS. At lower levels (~0.25 ppm) of aqueous ozone, intermediate products were observed. On the basis of UV and MS data, it is proposed that the degradation begins with attack of ozone at the C9-10 double bond with the net addition of two atoms of oxygen. The remainder of the molecule appears to have been left unaltered. The oxidation state at the allylic carbon 8 position had a significant effect on the ease of reaction, as determined by moles of ozone required to effect oxidation. The amount of ozone required to effect oxidation to intermediate products and subsequent degradation followed the series allylic methylene (no oxygen) < hydroxyl (or ester) < keto. Ozonation was also sensitive to pH. At pH 4-6, all mycotoxins studied degraded readily; at pH 7-8 the degree of reactivity was dependent upon the carbon 8 oxidation state; at pH 9, there was little or no reaction. Structures for some of the intermediate products are proposed.
Keywords: Mycotoxins; Trichothecenes; Degradation; Ozonation; pH

G. Berhane, L.O. Eik, Effect of vetch (Vicia sativa) hay supplementation on performance of Begait and Abergelle goats in northern Ethiopia: I. Milk yield and composition,
Small Ruminant Research, Volume 64, Issue 3, August 2006, Pages 225-232, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2005.04.021.
(http://www.sciencedirect.com/science/article/B6TC5-4GJM3RM-1/2/17663f03d383a34fa7a1cb0efdef7f78)
Abstract:
The objectives of this work were to study and compare the effect of vetch hay supplementation on milk yield of indigenous Begait and Abergelle goats, managed under semi-extensive conditions in the lowlands of northern Ethiopia, and to compare milk yield and composition of the two breeds.
Eleven 7-8-month-old goats from each breed were randomly assigned to each of the four levels of vetch hay supplementation at 0% BW (Treatment 1), 0.5% BW (Treatment 2), 1.0% BW (Treatment 3) and 1.5% BW (Treatment 4). Goats were grazed during daytime and milked in the evening only. Kids were allowed to suck their dams during the night up to 90 days and then weaned. Milk yield and lactation length increased gradually and almost linearly by increasing level of supplementation, while fat percentage and total solids percentage declined. Differences ($P < 0.05$) in average daily milk yield were found between Treatments 1 and 4 for both goat breeds in both years. Milk yield was significantly higher, but fat and SNF contents were lower for Begait than for Abergelle goats. When calculated as energy corrected milk (ECM)/kg metabolic BW, no breed differences were found. There were no significant differences for calcium and phosphorus contents in milk between the breeds. It is concluded that vetch hay supplementation increased milk yield by up to 50%, but decreased percent fat and total solids in the milk of both Begait and Abergelle goats.
Keywords: Goats; Begait; Abergelle; Milk; Vetch hay

Hamed K. Abbas, Richard D. Cartwright, Weiping Xie, W. Thomas Shier, Aflatoxin and fumonisin contamination of corn (maize, Zea mays) hybrids in Arkansas,
Crop Protection, Volume 25, Issue 1, January 2006, Pages 1-9, ISSN 0261-2194, DOI: 10.1016/j.cropro.2005.02.009.
(http://www.sciencedirect.com/science/article/B6T5T-4G002DM-1/2/09efac96d5624a7a46907ea2c0743cbd)

Abstract:
A severe infestation by aflatoxin-producing fungi diminished food quality of southern United States corn (maize) in 1998. Corn hybrids (65) naturally infected with Fusarium spp. and Aspergillus spp. were evaluated from 1998 to 2001 for resistance to mycotoxin contamination. Kernel corn samples were assayed at harvest for aflatoxins and fumonisins. In 1998, samples from all hybrids exceeded 20 ppb aflatoxin (mean levels: 21-699 ppb) and 2 ppm fumonisins (mean levels: 23-79 ppm), the maximum levels permitted by United States Food and Drug Administration guidelines. Samples from hybrids planted in the same and other locations in Arkansas in 1999 and 2001 were shown by similar methods to contain aflatoxin levels ranging from not detected to 255.3 ppb and fumonisin levels from 0.3 to 83.6 ppm. The fumonisin levels in 2001 were very high in all hybrids, ranging from 8 to 83.6 ppm while aflatoxin levels were low ranging from <5 in most hybrids to 131 ppb. The presence of aflatoxin B1 and B2 in samples was confirmed by thin layer chromatography and liquid chromatography/mass spectrometry and fumonisins B1, B2, B3, B4 and C4 by liquid chromatography/mass spectrometry. During the period studied, a positive correlation was observed between aflatoxin and fumonisin levels, indicating that natural infection with Fusarium spp. did not appear to protect against aflatoxin production.
Keywords: Aflatoxin; Fumonisin; Corn hybrids; Maize; Mycotoxins; Heat stress; Drought; Insect damage; Ear rots; Aspergillus; Fusarium

Margrete Eknaes, Kari Kolstad, Harald Volden, Knut Hove, Changes in body reserves and milk quality throughout lactation in dairy goats,
Small Ruminant Research, Volume 63, Issues 1-2, May 2006, Pages 1-11, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2004.11.016.
(http://www.sciencedirect.com/science/article/B6TC5-4FTWJJ8-1/2/cc9620eba2cfa81cf97950ce50b04b6e)

Abstract:
Due to variations in the flavour of Norwegian goat milk, it has been difficult to develop new goat milk products with constant flavour characteristics. In particular, rancid and tart flavour is a challenge for the dairy industry. Milk produced during periods when goats experience a negative energy balance tends to have low dry matter content and a high frequency of rancid and tart flavour. In the present experiment the energy status of goats was examined throughout lactation by studying changes in body composition and blood parameters.
The experiment included twelve goats of the Norwegian Dairy Breed, studied from kidding until 7 months of lactation. The goats grazed cultivated lowland pasture during spring and autumn, and mountain pasture for 9 weeks in summer. Milk and blood samples were collected on days 11, 60, 74,125,145 and 199 of lactation and connected to estimation of body composition by means of computer tomography.

From day 11 until day 125 of lactation, energy supply from the pasture was insufficient, and adipose tissue mass decreased by 3.5 kg in average. Plasma concentrations of non-esterified fatty acids (NEFA) and acetoacetate were elevated. Likewise, the concentration of free fatty acids (FFA) in milk increased, as did the relative proportion of C18 acids. The goats started to produce milk of inferior quality (FFA > 2.0 mmol/l) around day 74 of lactation, when approximately 40% of their prepartum adipose tissue mass was mobilized. After three weeks with lowland grazing in the autumn, the goats deposited body fat again and the concentration of free fatty acids in milk was lowered. The situation improved further during the following 8 weeks on indoor feeding as fat accretion continued.

Keywords: Goat; Body fat reserves; Computer tomography; Free fatty acids in milk; NEFA and acetoacetate in blood

O.A. Koya, M.O. Faborode, Separation Theory for Palm Kernel and Shell Mixture on a Spinning Disc,

Biosystems Engineering, Volume 95, Issue 3, November 2006, Pages 405-412, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2006.07.005.
(http://www.sciencedirect.com/science/article/B6WXV-4KSSWDR-2/2/34c8594eae1516181c1027fbf3173ab9)

Abstract:
The separation of palm kernel from the shell is an important process in the recovery of the kernel for use in vegetable oil production. The inherent shortcoming of the fertiliser spinner spreader, resulting in non-uniform distribution, has led to investigations into the possibility of its use in the separation of palm kernel from shell. The differences in the physical properties of the kernel and shell provided the basis for separation. Models describing the motion of the kernel and the shell on a spinning disc with vanes, feeding a segment at a time, were developed, and comparisons between the predictions and experimental results were made.
Discharge angles obtained from the predictive models and from the experiment were in close agreement. The experiment, however, indicated a mid-span, between the discharge angles for kernels and shells, containing the mixture. The models reasonably predict approximate ranges of discharge angles for palm kernels and shells on a spinning disc with specified diameter, friction coefficient and rotational speed.

P. Melendez, C.C. Hofer, G.A. Donovan, Risk factors for udder edema and its association with lactation performance on primiparous Holstein cows in a large Florida herd, U.S.A.,

Preventive Veterinary Medicine, Volume 76, Issues 3-4, 17 October 2006, Pages 211-221, ISSN 0167-5877, DOI: 10.1016/j.prevetmed.2006.05.004.
(http://www.sciencedirect.com/science/article/B6TBK-4K5SSWY-6/2/4a03adf3a2d36d246ce7e374d7cceefa)

Abstract:
The objective of this study was to determine risk factors for udder edema (case-control study) and to evaluate the association of udder edema in primiparous Holstein cows with their lactation performance (cohort study). Values for the first 10 test day for milk yield, fat, protein, and somatic cell counts (SCC) linear score as well as mature

equivalent (ME) 305 days milk yield, fat, protein, SCC linear score, and incidences of periparturient diseases from a computerized farm recording system were compared between primiparous cows with and without udder edema. Data consisted of 118 dairy heifers with udder edema, induced for parturition, and treated with diuretics and 889 control heifers that received no treatment. Primiparous cows giving birth to male calves, were 1.72 (1.01, 3.24; 95% CI) times more likely to develop udder edema than cows giving birth to female calves. Primiparous cows calving in winter season were 3.68 (1.09, 12.5; 95% CI) times more likely to develop udder edema than cows calving in summer. For each extra 10 cm in height the odds of udder edemas was 1.23 (1.03, 1.47; 95% CI). The first test day DHIA milk yield was lower in cows that developed udder edema (3.6 kg/day) than in normal cows. However, the subsequent test days and ME measurements were not statistically different between groups. Cows with udder edema were 1.62 (1.18, 2.14; 95% CI) times more likely to develop udder edema in the second lactation than control animals. It is concluded that the gender of the offspring, calving season and height at parturition were significant risk factors for udder edema. Only milk yield on the first DHIA test day was lower in cows with udder edema than in cows without udder edema.

Keywords: Udder edema; Milk yield; Risk factors; Periparturient diseases

Daniel Rondelaud, Philippe Vignoles, Gilles Dreyfuss, Christian Mage, The control of Galba truncatula (Gastropoda: Lymnaeidae) by the terrestrial snail Zonitoides nitidus on acid soils,

Biological Control, Volume 39, Issue 3, December 2006, Pages 290-299, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2006.07.015.
(http://www.sciencedirect.com/science/article/B6WBP-4KM43C5-2/2/bf3dfe638b85dd93b66a72d8a9ba1beb)

Abstract:
Field investigations on the control of Galba truncatula by Zonitoides nitidus were carried out over the past 30 years in the different types of lymnaeid habitats located in central France. When a layer of mowed vegetation was used to cover G. truncatula habitats at the end of June, the introduction of adult Z. nitidus (20/m2) eliminated lymnaeid populations after 2 years of control in habitats located in swampy meadows, around the heads of intermittent springs, in areas trampled by cattle, and along river or pond banks. In the case of wild watercress beds, 3 years were necessary. The best results (elimination of G. truncatula after a single year of control) were obtained using an association of snails (Z. nitidus + Oxychilus draparnaudi), or a mixed control (a first application of 0.1 mg/l CuCl2, followed 3 months later by the introduction of Z. nitidus). Recolonization of treated habitats by G. truncatula coming from downstream populations was noted 3 years following the last application of biological control. Apart from the regular introduction of Z. nitidus in several watercress beds, the use of this snail to control G. truncatula has not become generalized in cattle- and sheep-breeding farms. The reasons for this situation are probably the complexity of applying this control in the field by nonspecialists and the difficulty of selecting the period of snail control at the end of June due to frequent local rainfall at this time.

Keywords: Galba truncatula; Zonitoides nitidus; Biological control; Central France; Mollusca

Renato Carrha Leitao, Adrianus Cornelius van Haandel, Grietje Zeeman, Gatze Lettinga, The effects of operational and environmental variations on anaerobic wastewater treatment systems: A review***,***
Bioresource Technology, Volume 97, Issue 9, June 2006, Pages 1105-1118, ISSN 0960-8524, DOI: 10.1016/j.biortech.2004.12.007.
(http://www.sciencedirect.com/science/article/B6V24-4FJTNY2-2/2/ae7a9dbce8488fd208264962b42b725c)
Abstract:
With the aim of improving knowledge about the stability and reliability of anaerobic wastewater treatment systems, several researchers have studied the effects of operational or environmental variations on the performance of such reactors. In general, anaerobic reactors are affected by changes in external factors, but the severity of the effect is dependent upon the type, magnitude, duration and frequency of the imposed changes. The typical responses include a decrease in performance, accumulation of volatile fatty acids, drop in pH and alkalinity, change in biogas production and composition, and sludge washout. This review summarises the causes, types and effects of operational and environmental variation on anaerobic wastewater treatment systems. However, there still remain some unclear technical and scientific aspects that are necessary for the improvement of the stability and reliability of anaerobic processes.
Keywords: Anaerobic reactors; Anaerobic wastewater treatment system; Operational variations; Environmental variations; Steady state conditions; Shock loads; Transient conditions

G. Royer, E. Madieta, R. Symoneaux, F. Jourjon, Preliminary study of the production of apple pomace and quince jelly, LWT –
Food Science and Technology, Volume 39, Issue 9, European Symposium on Apple Processing, November 2006, Pages 1022-1025, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.02.015.
(http://www.sciencedirect.com/science/article/B6WMV-4JKRWMF-1/2/dedbd84ccc52ddc3c46ed3d3a1dd1e97)
Abstract:
Apple pomace, a cheap by-product of apple juice and cider production, is rich in pectins and flavour compounds. Thus, a possible way of valorization of apple pomace was using it for jelly production. Fresh apple pomace from Braeburn, Gala, Golden Delicious and Granny Smith was used for the preparation of jelly to study the amount of sugar and quince content and the cooking time effect. The response surface methodology was used to study the preparation of apple pomace jelly and responses studied were textural characteristics and overall acceptability. The hardness of jelly was not affected by the factors studied whereas cohesiveness and overall acceptability were affected by the concentration of quince and sugar. The most appreciated jellies were those prepared with the highest quince concentration and the lowest sugar concentration.
Keywords: Apple pomace; Quince; Jelly production; Surface response method; Texture analysis; Sensory analysis

Natasa Atanasova, Ljupco Todorovski, Saso Dzeroski, Spela Rekar Remec, Friedrich Recknagel, Boris Kompare, Automated modelling of a food web in lake Bled using measured data and a library of domain knowledge,
Ecological Modelling, Volume 194, Issues 1-3, Special Issue on the Fourth European Conference on Ecological Modelling - Selected Papers from the Fourth European Conference on Ecological Modelling, September 27 - October 1, 2004, Bled, Slovenia, 25 March 2006, Pages 37-48, ISSN 0304-3800, DOI: 10.1016/j.ecolmodel.2005.10.029.
(http://www.sciencedirect.com/science/article/B6VBS-4HVF11B-1/2/5caedfdf3326a8d4e192e2eddc3caee7)

Abstract:
In this paper, we applied automated modelling (computer model construction) method to the task of modelling a complex lake ecosystem. The method (Lagramge) integrates domain expert knowledge in the process of automated model induction from given data set. The data set comprises long-term measurements (from 1995 to 2002) of physical, chemical and biological data in lake Bled, Slovenia. Given expert knowledge in terms of a simple food web concept and rules for modelling thereof, we first induced a model for long-term dynamics of the phytoplankton in the lake. Failing to obtain a good fit, we also induced models of phytoplankton dynamics for each year separately. The differences between these models indicate structural dynamics of the food web in lake Bled, i.e., indicate that the behaviour of the lake is changing from year to year. Additionally, we successfully induced a three-equation model (nutrient-phytoplankton-zooplankton) on the data from year 1996.

Keywords: Aquatic ecosystems; Food web modelling; Dynamic systems; Automated modelling; Computational scientific discovery

R. Marino, M. Albenzio, A. Braghieri, A. Muscio, A. Sevi, Organic farming: effects of forage to concentrate ratio and ageing time on meat quality of Podolian young bulls, ***Livestock Science***, Volume 102, Issues 1-2, June 2006, Pages 42-50, ISSN 1871-1413, DOI: 10.1016/j.livsci.2005.11.004.
(http://www.sciencedirect.com/science/article/B7XNX-4J791RY-2/2/8b86bea9df9c9e87903475a5f8198652)

Abstract:
This study aimed to assess the effect of a different forage to concentrate ratio (60 to 40 (HC group) vs. 70 to 30 (LC group)) and ageing (15 vs. 21 days) on meat quality of Podolian young bulls, organically farmed. Longissimus dorsi was divided in two sections, aged in vacuum-packaging at 4 [degree sign]C until 15 and 21 days postmortem, respectively. Meat chemical composition was unaffected by diet and ageing time. Colour parameters were not affected by diet, while red index a* and chroma decreased from 15 to 21 days of ageing, and yellow index and hue angle were found higher ($P < 0.001$) at 21 than at 15 days postmortem. The meat from the LC group showed lower ($P < 0.01$) Warner-Bratzler shear force (WBSF) values than that from the HC group after 15 days of maturation. Extending ageing time from 15 to 21 days produced a significant ($P < 0.001$) reduction of WBSF. Diet effect on sensory tenderness was significant ($P < 0.05$) after 15 days of ageing with higher tenderness scores in the LC than in the HC group. Ageing positively affected sensory tenderness (P

< 0.05) in the HC group. Flavour intensity was increased by the extension of the ageing period (P < 0.001), whereas no diet effect was evidenced on this parameter.
Keywords: Podolian young bulls; Forage to concentrate ratio; Ageing time; Tenderness; Sensory properties

N. Hudson, D. Duperouzel, S. Melvin, Assessment of permeable covers for odour reduction in piggery effluent ponds. 1. Laboratory-scale trials,
Bioresource Technology, Volume 97, Issue 16, November 2006, Pages 2002-2014, ISSN 0960-8524, DOI: 10.1016/j.biortech.2005.11.002.
(http://www.sciencedirect.com/science/article/B6V24-4J5T5SW-1/2/3f8d35c9c3d8a479d240ec0af265ff4d)
Abstract:
A variety of materials were trialed as supported permeable covers using a series of laboratory-scale anaerobic digesters. Efficacy of cover performance was assessed in terms of impact on odour and greenhouse gas emission rate, and the characteristics of anaerobic liquor. Data were collected over a 12-month period.
Initially the covers reduced the rate of odour emission 40-100 times relative to uncovered digesters. After about three months, this decreased to about a threefold reduction in odour emission rate, which was maintained over the remainder of the trial. The covers did not alter methane emission rates. Carbon dioxide emission rates varied according to cover type. Performance of the covers was attributed to the physical characteristics of the cover materials and changes in liquor composition. The reductions in odour emission indicate that these covers offer a cost-effective method for odour control.
Keywords: Anaerobic; Odour; Emission; Management; Supported; Straw; Permeable; Cover; Laboratory-scale

P.F. Fox, A.L. Kelly, Indigenous enzymes in milk: Overview and historical aspects--Part 1, International Dairy Journal, Volume 16, Issue 6,
First IDF Symposium on Indigenous Enzymes in Milk, June 2006, Pages 500-516, ISSN 0958-6946, DOI: 10.1016/j.idairyj.2005.09.013.
(http://www.sciencedirect.com/science/article/B6T7C-4JB9MT1-2/2/bddd6a53dc3a874594ff13b4f47ea4e6)
Abstract:
The indigenous enzymes in milk have been the subject of research since 1881 when the first report on an indigenous enzyme (lactoperoxidase (LPO)) appeared. These enzymes originate from an animal's blood plasma, leucocytes (somatic cells) and the apical membrane or cytoplasm of the secretory cells. By the early 20th century, seven indigenous enzymes had been identified in milk: LPO, catalase, xanthine oxidase, proteinase, lipase, salolase (arylesterase) and amylase. These were probably the most widely recognised enzymes at that time and, in addition, some of them were relatively easily assayed or were technologically important. The progress of research on these enzymes to the present date will be reviewed in this article.
Keywords: Enzymes; Milk; Lactoperoxidase; Catalase; Xanthine oxidase; Plasmin; Lipase; Amylase

Tom Gheskiere, Vincx Magda, Pison Greet, Degraer Steven, Are strandline meiofaunal assemblages affected by a once-only mechanical beach cleaning? Experimental findings*,*
Marine Environmental Research, Volume 61, Issue 3, April 2006, Pages 245-264, ISSN 0141-1136, DOI: 10.1016/j.marenvres.2005.10.003.
(http://www.sciencedirect.com/science/article/B6V7H-4HRDY55-1/2/573d9c7d51d47f0d606f90a566d26033)

Abstract:
The increasing usage of sandy beaches as recreational resources has forced regional authorities of many tourist countries to remove all litter of fabricated origin and natural wrack from the beach. Consequently, a variety of heavy equipment has been developed during the last decades and is now used almost daily at many beaches. A field experiment, following a `before-after-control-impact' (BACI) design, was conducted at the strandline of De Panne (Belgium) to investigate the impacts of mechanical beach cleaning on the strandline-associated meiofaunal assemblages, focussing on the free-living nematodes. Natural strandline assemblages were exposed to a one-off 5 cm deep mechanical beach cleaning and observed for 24 h. Differences between cleaned plots and those from control plots in terms of decreased percentage of organic matter, decreased total abundance and changed community structure were noticed from immediately after the experimental cleaning onwards and recovered to initial values after the following high water. Any impacts due to cleaning on species richness, Pielou's evenness and taxonomic diversity were shown to be minor in relation to the daily changes. Recolonization in the cleaned sediments is assumed to occur from the underlying sediments initiated by the elevated water table during the rising tide.
Keywords: Meiofauna; Free-living nematodes; Sandy beach; Mechanical beach cleaning; Disturbance; BACI; Recovery; North Sea

David E. Pegg, Lihong Wang, David Vaughan, Charles J. Hunt, Cryopreservation of articular cartilage. Part 2: Mechanisms of cryoinjury,
Cryobiology, Volume 52, Issue 3, June 2006, Pages 347-359, ISSN 0011-2240, DOI: 10.1016/j.cryobiol.2006.01.007.
(http://www.sciencedirect.com/science/article/B6WD5-4JF97R4-1/2/152a1febecd89a3d7e1af5f3e24a17a6)

Abstract:
Although isolated chondrocytes can be cryopreserved by standard methods, at the present time there is no satisfactory method that will preserve living chondrocytes in situ in surgical grafts, between the time of procurement or manufacture and actual use; survival of living chondrocytes in situ is inadequate at best and is also very variable. The first step in identifying the cause of this discrepancy was to establish that the cryoprotectants we had chosen to use, dimethyl sulphoxide and propylene glycol, do actually penetrate into the tissue rapidly. They do. Moreover, chondrocytes were shown to tolerate 10 or 20% Me2SO and were not unusually susceptible to osmotic stress. An experiment in which the effects of freezing with 10% Me2SO to -50 [degree sign]C were separated from the effects of the concomitant rise in solute concentration showed that injury was associated with the formation of ice as such. Freeze substitution microscopy showed that large ice crystals were formed within the chondron, some at least within

chondrocytes, even when the cooling rate was optimal for isolated chondrocytes. It is proposed that the nucleation and preferential growth of ice within the chondron (rather than the surrounding acellular matrix) is responsible for the very poor survival of chondrocytes in situ when current methods of cartilage cryopreservation are used.
Keywords: Cartilage; Cryoinjury; Cryomicroscopy; Me2SO transport; Freeze substitution; Isothermal freeze-fixation

David E. Pegg, Monica C. Wusteman, Lihong Wang, Cryopreservation of articular cartilage. Part 1: Conventional cryopreservation methods,
Cryobiology, Volume 52, Issue 3, June 2006, Pages 335-346, ISSN 0011-2240, DOI: 10.1016/j.cryobiol.2006.01.005.
(http://www.sciencedirect.com/science/article/B6WD5-4JF8HJV-1/2/f6b0f31044f8f9fb8d4ff61620d26284)
Abstract:
There is increasing interest in the possibility of treating diseased or damaged areas of synovial joint surfaces by grafts of healthy allogeneic cartilage. Such grafts could be obtained from cadaver tissue donors or in the future they might be manufactured by `tissue engineering' methods. Cartilage is an avascular tissue and hence is immunologically privileged but to take advantage of this is the graft must contain living cells. Preservation methods that achieve this are required to build up operational stocks of grafts, to provide a buffer between procurement and use, and to enable living grafts of a practical size to be provided at the right time for patient and surgeon. Review of the literature shows that it has been relatively straightforward to cryopreserve living isolated chondrocytes, but at the present time there is no satisfactory method to preserve cartilage between the time of procurement or manufacture and surgical use. In this paper, we review the relevant literature and we confirm that isolated ovine chondrocytes in suspension can be effectively cryopreserved by standard methods yet the survival of chondrocytes in situ in cartilage tissue is inadequate and extremely variable.
Keywords: Cartilage; Cryopreservation; Chondrocyte; Dimethyl sulphoxide; Propylene glycol; Cryoprotectant transport

Sven Bernesson, Daniel Nilsson, Per-Anders Hansson, A limited LCA comparing large- and small-scale production of ethanol for heavy engines under Swedish conditions, ***Biomass and Bioenergy,*** Volume 30, Issue 1, January 2006, Pages 46-57, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2005.10.002.
(http://www.sciencedirect.com/science/article/B6V22-4HPKBRX-1/2/6c49cb2dc214aae683c83956165e6d92)
Abstract:
Ethanol is a renewable fuel that can be produced in small farm-scale plants as well as in medium- and large-scale industrial plants for use in e.g. heavy diesel engines. The purpose of this study was to analyse whether the use of a small-scale production system reduced the environmental load in comparison to a medium- and a large-scale system. Therefore, a limited life cycle assessment (LCA), including air emissions and energy requirements, was carried out for the three plant sizes. For the small plant and with physical allocation, the global-warming potential was 31.5 g CO2-eq/MJfuel, the acidification potential was 198 mg SO2-eq/MJfuel, the eutrophication potential was 30.9

mg PO43--eq/MJfuel, the photochemical ozone creation potential was 13.8 mg C2H4-eq/MJfuel and the energy requirement 359 kJ/MJfuel. It was shown that the differences in environmental impact and energy requirement between small-, medium- and large-scale systems were small. The longer transport distances to a certain degree outweighed the higher energy efficiency and the more efficient use of machinery and buildings in the large-scale system. The dominating production step was the cultivation, in which production of fertilisers, followed by soil emissions and tractive power, made major contributions to the environmental load. The choice of allocation method had a certain influence on the difference between the scales, whereas the influence of uncertainty in input data and of some alternative production strategies was small.
Keywords: Ethanol; Bioenergy; Fuel production; LCA; Life cycle assessment; Small-scale production; Large-scale production; Heavy engines

Ulrich S. Schwarz, Thorsten Erdmann, Ilka B. Bischofs, Focal adhesions as mechanosensors: The two-spring model,
Biosystems, Volume 83, Issues 2-3, 5th International Conference on Systems Biology - ICSB 2004, February-March 2006, Pages 225-232, ISSN 0303-2647, DOI: 10.1016/j.biosystems.2005.05.019.
(http://www.sciencedirect.com/science/article/B6T2K-4HC776X-5/2/408f24a47baa2da36477113ff0605ee8)
Abstract:
Adhesion-dependent cells actively sense the mechanical properties of their environment through mechanotransductory processes at focal adhesions, which are integrin-based contacts connecting the extracellular matrix to the cytoskeleton. Here we present first steps towards a quantitative understanding of focal adhesions as mechanosensors. It has been shown experimentally that high levels of force are related to growth of and signaling at focal adhesions. In particular, activation of the small GTPase Rho through focal adhesions leads to the formation of stress fibers. Here we discuss one way in which force might regulate the internal state of focal adhesions, namely by modulating the internal rupture dynamics of focal adhesions. A simple two-spring model shows that the stiffer the environment, the more efficient cellular force is built up at focal adhesions by molecular motors interacting with the actin filaments.
Keywords: Cell-matrix adhesion; Extracellular matrix; Cytoskeleton; Mechanotransduction; Modeling

K.B. Matthews, K. Buchan, A.R. Sibbald, S. Craw, Combining deliberative and computer-based methods for multi-objective land-use planning,
Agricultural Systems, Volume 87, Issue 1, January 2006, Pages 18-37, ISSN 0308-521X, DOI: 10.1016/j.agsy.2004.11.002.
(http://www.sciencedirect.com/science/article/B6T3W-4FMHSVJ-1/2/542ec3aa4764f4ba94ee495b6ee94d57)
Abstract:
This paper reports the outcomes of a deliberative workshop comparing land-use plans proposed by land-manager or domain experts with those derived using a computer-based decision support system (DSS). The DSS integrates four main components, a geographic information system, land-use systems simulation models, impact

assessments and land-use planning tools. The land-use planning tools draw on the other components to generate and evaluate alternative patterns of land use and management. Since the land-use planning tools are based on multi-objective genetic algorithms (mGAs) it is possible to generate a range of alternative plans that define the structure of the trade-off between the objectives. The workshop tasked the delegates with specifying land-use plans that achieved the best compromise between two objectives known to be non-commensurable and conflicting. The nature of the best compromise was dependent on their individual perspectives. The delegates proposed allocations both as individuals and in researcher-facilitated sub-groups. The mGA allocations were then compared with those derived by delegates and were found to be broadly similar in performance. Differences in the range of allocations considered feasible were explained by the hard and soft constraints on allocations agreed between the delegates and articulated within the workshop process. The hypothesis that part of the difference in performance between the mGA and delegate allocations was due to the delegates blocking together fields with the same land use for convenience of management was proved. The analysis of the group allocations revealed that the decision-making process had failed to improve on the individual allocations. From these results it was concluded that there was a potential role for mGA based land-use planning tools in researching into, and deliberating on, the possible impacts of policy or other factors affecting land-use systems. It was further concluded that the tools should not be used in isolation since there was the need for stake-holder inputs to adequately define the range of feasible and practical land-use plans.

Keywords: Decision support; Land use; Multi-objective; Genetic algorithms; Deliberative

Shrikant Baslingappa Swami, B. Maiti, S.K. Das, Development of an extrusion system for Bori and force characteristics of its batter during extrusion,

Journal of Food Engineering, Volume 73, Issue 1, March 2006, Pages 20-28, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.01.001.
(http://www.sciencedirect.com/science/article/B6T8J-4FKYDK7-2/2/6d077149fdec22547072628a5d4bcb35)

Abstract:

An extrusion system with intermittent discharge mechanism has been developed for preparing conical shaped nuggets (bori, a traditional Indian product) from semi-solid pulse batter. The system is comprised of a barrel and plunger, a piston and a receiving tray. All operates in synchronized manner with gear and chain drive mechanism to discharge an array of nuggets one after another on the receiving tray with the manual rotation of a handle. The speed of the plunger inside the barrel could be regulated by using interchangeable lead screws having different pitches.

Irrespective of the speed (displacement/time) of the plunger inside the barrel continuous operation of the extrusion showed a constant force (steady state) zone followed by an increasing trend. However, the length of this zone (duration) decreased with the increase in either speed of the plunger or L/D ratio of the extruder die. Average extrusion force at the steady state region varied from 3.9 to 5.9 N, 5.7 to 8.1 N and 9.9 to 14.8 N for L/D ratio of 2/12, 2/10 and 2/8, respectively for plunger speeds from 1.67 to 5.00 mm/s. At the same plunger speed, the force-time profile for discontinuous

(intermittent) extrusion showed similar trend to that of continuous extrusion, however, the levels of (peak values) forces were higher for the former, for the entire range of plunger displacement. For a particular set of operation uniform product formation was ensured from the least variation of the diameter of the discharged nuggets over the respective mean values. Whole extrusion system requires 45 watts for formation of array of nuggets.

Keywords: Extrusion; Nuggets; Pulse products; Convenience food

Byron J. Adams, Andras Fodor, Heather S. Koppenhofer, Erko Stackebrandt, S. Patricia Stock, Michael G. Klein, Biodiversity and systematics of nematode-bacterium entomopathogens, ***Biological Control,*** Volume 37, Issue 1, April 2006, Pages 32-49, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2005.11.008.
(http://www.sciencedirect.com/science/article/B6WBP-4J0NY4F-1/2/4b422ce7056361962a81ba964d31873f)

Abstract:
Nematodes are one of the most abundant animals on earth, and bacteria comprise the most biologically and phylogenetically diverse domains of organisms. On at least two separate occasions a soil dwelling nematode and a bacterium have entered into a mutualistic, insecticidal association. From such origins arose two distinct lineages of nematode-bacterium entomopathogens, Steinernema-Xenorhabdus and Heterorhabditis-Photorhabdus. Herein, we present a summary and discussion of the known evolutionary diversity and systematics of these two groups relative to other nematodes and bacteria, and their shared evolutionary history.

Keywords: Biodiversity; Heterorhabditis; Steinernema; Photorhabdus; Xenorhabdus; **Taxonomy; Systematics; Evolution; Entomopathogenic nematodes; Mutualism; Symbiosis**

Byron J. Adams, Andras Fodor, Heather S. Koppenhofer, Erko Stackebrandt, S. Patricia Stock, Michael G. Klein, Reprint of 'Biodiversity and systematics of nematode-bacterium entomopathogens' [Biol. Control 37 (2006) 32-49],
Biological Control, Volume 38, Issue 1, Third International Symposium on Entomopathogenic Nematodes and Symbiotic Bacteria, July 2006, Pages 4-21, ISSN 1049-9644, DOI: 10.1016/S1049-9644(06)00126-5.
(http://www.sciencedirect.com/science/article/B6WBP-4K48SCF-3/2/4bd78dde31c95de9fda30515fb43e928)

Abstract:
Nematodes are one of the most abundant animals on earth, and bacteria comprise the most biologically and phylogenetically diverse domains of organisms. On at least two separate occasions a soil dwelling nematode and a bacterium have entered into a mutualistic, insecticidal association. From such origins arose two distinct lineages of nematode-bacterium entomopathogens, Steinernema-Xenorhabdus and Heterorhabditis-Photorhabdus. Herein, we present a summary and discussion of the known evolutionary diversity and systematics of these two groups relative to other nematodes and bacteria, and their shared evolutionary history.

Keywords: Biodiversity; Heterorhabditis; Steinernema; Photorhabdus; Xenorhabdus; Taxonomy; Systematics; Evolution; Entomopathogenic nematodes; Mutualism; Symbiosis

Zach Adam, Andrea Rudella, Klaas J van Wijk, Recent advances in the study of Clp, FtsH and other proteases located in chloroplasts,
Current Opinion in Plant Biology, Volume 9, Issue 3, Physiology and metabolism / edited by Eran Pichersky and Krishna Niyogi, June 2006, Pages 234-240, ISSN 1369-5266, DOI: 10.1016/j.pbi.2006.03.010.
(http://www.sciencedirect.com/science/article/B6VS4-4JRKD70-2/2/ac04b2e7f67a9d36a60662565563e047)
Abstract:
Several chloroplast proteases have been characterized in recent years. The ATP-dependent chloroplast proteases Clp and FtsH stand out because they form multi-subunit complexes consisting of different gene products. Surprisingly, both green and non-green plastids appear to contain a similar soluble Clp core proteolytic complex, consisting of five ClpP proteases, their non-catalytic ClpR homologs, and two ClpS homologs that have unknown function. Analyses of single and double FtsH1, FtsH2, FtsH5 and FtsH8 mutants, and overexpression of FtsH proteins in these Arabidopsis thaliana mutants show partial redundancies within pairs of closely related FtsH thylakoid proteins. The presence of at least one member of each pair is essential for functional accumulation. Other chloroplast proteases have also been identified recently. Future challenges include the identification of substrate recognition mechanisms and elucidating the role of proteases in chloroplast biogenesis and function.

M.A. Aparicio Tovar, J.D. Vargas Giraldo, Considerations on ethics and animal welfare in extensive pig production: Breeding and fattening Iberian pigs,
Livestock Science, Volume 103, Issue 3, Ethics in Animal Agriculture, September 2006, Pages 237-242, ISSN 1871-1413, DOI: 10.1016/j.livsci.2006.05.010.
(http://www.sciencedirect.com/science/article/B7XNX-4K9C58G-1/2/0827d96bf74d2365bdc54084bd13f9da)
Abstract:
The extensive pig production in Spain is traditionally characterised by: the use of the Iberian pig, an autochthonous breed perfectly integrated into the environment in which they have developed; a long duration of the productive cycle for about 23-24 months; a high level of animal welfare level, specially in the fattening process with freedom of movement and feeding base on natural sources: acorns and grass, and an equilibrated 'dehesa' agro-forestry system where this activity has been developed. Nowadays, the introduction of more intensificated methods due to the increasing demand led to important changes, such as: the shortening of the productive cycle (10-12 months); freeing from the territorial base; changes during the fattening period, fattening with mixed feed and less animal freedom. All these facts may implicate a loss of the animal welfare condition. These circumstances lead us to question it from an ethical point of view.
Keywords: Extensive pig production; Breeds; Outdoor; Animal welfare; Ethics

John M. Archibald, Endosymbiosis: Double-Take on Plastid Origins,
Current Biology, Volume 16, Issue 17, 5 September 2006, Pages R690-R692, ISSN 0960-9822, DOI: 10.1016/j.cub.2006.08.006.
(http://www.sciencedirect.com/science/article/B6VRT-4KTNH9W-M/2/f94e0f9407b7cac1857ea35ec5e3681b)

Abstract:
Plastids -- the light-harvesting machines of plant and algal cells -- evolved from cyanobacteria inside a eukaryotic host more than a billion years ago. New data reveal that a mysterious unicellular alga acquired its photosynthetic apparatus much more recently than other eukaryotes, affording a second look at the primary endosymbiotic origin of plastids.

Hoa T.K. Ho, Len J.A. Lipman, Wim Gaastra, Arcobacter, what is known and unknown about a potential foodborne zoonotic agent!,
Veterinary Microbiology, Volume 115, Issues 1-3, 15 June 2006, Pages 1-13, ISSN 0378-1135, DOI: 10.1016/j.vetmic.2006.03.004.
(http://www.sciencedirect.com/science/article/B6TD6-4JRVDXG-4/2/10fae990e0ed77e178c64bd221cdc8cb)

Abstract:
Since the introduction of the genus Arcobacter in 1991, the association of Arcobacter butzleri, Arcobacter cryaerophilus and Arcobacter skirrowii with humans and animals has been clearly established. These bacteria have been detected world wide in products of animal origin and in healthy animals as well as in surface water. A fourth species Arcobacter cibarius was recently discovered on chicken carcasses. Although evidence was found for the connection of Arcobacter spp. with human and animal illness, Arcobacter spp. can be pathogens, opportunistic pathogens and commensals. Their potential as zoonotic foodborne and waterborne agents, the routes of transmission and the pathogenic mechanisms of these bacteria are largely unknown. Production of toxins or other virulence factors has not been demonstrated but adhesive and/or invasive properties were apparent. Antibiotic resistance is present in Arcobacter strains to significant levels. The tools to genetically access Arcobacter-like transformation of strains, construction of mutants are not yet available. Nor have genes (i.e. potential virulence factors) been cloned, expressed and characterized in other host organisms. Therefore those interested in the microbiology of these organisms eagerly await publication of the complete nucleotide sequence of the Arcobacter genome.
The abundant presence of four Arcobacter species in foods of animal origin and the recovery of these bacteria from surface and drinking water suggest an important role of these bacteria as foodborne or waterborne agent and possibly as zoonotic agent.
Keywords: Arcobacter; Zoonosis; Prevalence; Pathogenicity; Antibiotic resistance

Michelle B. Pierce, Rebecca E. Crowell, Ann M. Ferris, Differing Perspectives of Inner-City Parents and Pediatric Clinicians Impact Management of Iron-Deficiency Anemia, ***Journal of Nutrition Education and Behavior***, Volume 38, Issue 3, May-June 2006, Pages 169-176, ISSN 1499-4046, DOI: 10.1016/j.jneb.2006.01.003.
(http://www.sciencedirect.com/science/article/B82X5-4K241HT-C/2/f5d169b3a1a4330dea44dcc972ff868f)

Abstract: Objective
To ascertain the beliefs and experiences of inner-city pediatric clinicians and parents regarding anemia in young children.Design
Focus groups and in-depth interviews.Setting
Pediatric clinics and community agencies in Hartford, Connecticut.Participants
Convenience sample of 41 pediatric clinicians (93% white, 73% female) and 85 parents (100% minority, 88% female, 47% < 12 years education).Phenomenon of Interest
Identification, understanding, and management of anemia.Analysis
Researcher pairs coded complete transcriptions. Recurrent themes were identified, which were then contrasted and compared between clinicians and parents.Results
Both clinicians and parents were familiar with, but frustrated by the persistence of anemia. They noted time constraints and poor communication during office visits as contributing to the problem. Parents felt alarmed upon initial diagnosis; linked anemia with heredity, food patterns, and activity; reported culturally linked management strategies; but were uncertain of the seriousness. Health clinicians saw physiological processes as outside the parents' understanding and emphasized prevention through feeding recommendations.Conclusions and Implications
In order to address childhood anemia effectively, differing socio-cultural perspectives of clinicians and parents need to be incorporated into a unified health care plan. Nutritionists are well suited to collaborate on the health care team to effectively address this issue.

Keywords: anemia; iron deficiency; urban health; culture

P.L. Nuthall, Determining the important management skill competencies: The case of family farm business in
New Zealand, Agricultural Systems, Volume 88, Issues 2-3, June 2006, Pages 429-450, ISSN 0308-521X, DOI: 10.1016/j.agsy.2005.06.022.
(http://www.sciencedirect.com/science/article/B6T3W-4GY87CB-1/2/591282d829312dae507e99e7d7ac0091)

Abstract:
Despite the extensive investment in developing computer based decision aids over many years, farmers have failed to utilise other than relatively simple systems, such as accounting and budgeting packages, to any great extent. Another approach to improving farming efficiency, which could well be more successful, is the development of training packages designed to improve farmers' management skills. These skills get used every day, many on an intuitive basis. The first task in developing this approach involves determining the skills farmers believe are important, and, therefore, need developing. This study provides answers, at least in the New Zealand setting, by reporting information from a large number of randomly selected farmers, as well as professional consultants. The results show both groups believe a wide range of skills

are important, and that the set is largely common across all farm types, age spectrums, educational backgrounds, as well as across the full range of `managerial styles' used by the farmers. Similarly, variations in objectives do not influence the ranking of the important skills. The conclusions can be summarised by noting the farmers believe selecting and managing people is a critical skill, as are the components of information gathering and the use of the information in planning, including risk management. Effective implementation of the plans is also regarded as being critical through skills such as anticipation, `looking ahead', and accurate and complete observation, resisting panic, and acting decisively. Devising automatic systems to improve these skills is the next challenge.

Keywords: Competencies; Skills; Decision skills; Farmer attributes; Management style; Entrepreneurial skills; Training

M. Yu, A.R. Womac, C. Igathinathane, P.D. Ayers, M.J. Buschermohle, Switchgrass ultimate stresses at typical biomass conditions available for processing, ***Biomass and Bioenergy,*** Volume 30, Issue 3, March 2006, Pages 214-219, ISSN 0961-9534, DOI: 10.1016/j.biombioe.2005.10.005.
(http://www.sciencedirect.com/science/article/B6V22-4HYN6PH-3/2/311d3afbc302e1f52908dce75a5aa579)

Abstract:
Biomass tensile and shear ultimate failure stresses were measured with the aim of identifying biomass 'weakest mode of failure' or 'natural fracture point' as a basis for future grinder designs. Switchgrass (Panicum virgatum L.) ultimate stresses were determined for Alamo and Kanlow varieties over ranges in maturity and moisture content. Alamo had greater ultimate tensile stress than Kanlow (P=0.0091), with mean values of 97.8 and 89.7 MPa, respectively. Alamo had greater ultimate shear stress than Kanlow (P=0.0091), with mean values of 20.5 and 17.9 MPa, respectively. Shear was the 'weakest mode of failure'. Grinders that use knives, shear bars, and mechanical pinch points that apply opposed-sliding actions are expected to be more energy efficient. Mean ultimate tensile stress and shear stress were significantly different between switchgrass varieties. A survey of failure stresses for a range of biomass feedstocks is recommended for future study. Ultimate tensile stress increased two-fold as elapsed time after harvest increased from 2 to 386 h, with a corresponding (confounded) decrease in moisture content of ~60-10% (wet basis (w.b.)). Future study should isolate whether the effect was due primarily to moisture or aging. Tensile-dominant size reduction should be conducted early in the harvest process and at a high moisture content to minimize energy consumption for grinding. Ultimate shear stress was relatively insensitive to switchgrass maturity, elapsed time after harvest, and moisture content.

Keywords: Grinding; Moisture content; Panicum virgatum L.; Shear stress; Size reduction; Tensile stress

J.A. Dyer, R.L. Desjardins, Carbon Dioxide Emissions Associated with the Manufacturing of Tractors and Farm Machinery in Canada,
Biosystems Engineering, Volume 93, Issue 1, January 2006, Pages 107-118, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2005.09.011.
(http://www.sciencedirect.com/science/article/B6WXV-4HMNG4B-3/2/c6c8a986e93346772b07747a23a0577e)
Abstract:
The energy required to manufacture farm machinery is almost as high as the fossil fuel energy consumed during farm field work. A method is needed to quantify this indirect energy and to relate it to farm management decisions, particularly reduced tillage. In this analysis the Farm Fieldwork and Fossil Fuel Energy and Emissions (F4E2) model, which has successfully estimated energy used for farm field work, was used to estimate the annual replacement rate for tractors and related farm machinery, and the associated CO2 emissions. Although the number of tractors simulated by the F4E2 model fell short of the reported numbers of tractors in Canada for 1991 and 1996, the average size of the simulated tractors was reasonably close to the average from the tractors across Canada recorded during Agricultural Census surveys. Distributions of simulated and recorded tractors showed similar shapes. The model estimated the net CO2 emissions from manufacturing to be 3[middle dot]6 Tg for 1996, which was within 2% of the estimate based on manufacturing energy derived from farm machinery expenditures. A simple index, also based on the F4E2 model, was used to extrapolate the 1996 national CO2 emission estimate to other Census years from 1981 to 2001 for use in Agri-environmental Indicators for Canada.

R.B. Edoura-Gaena, I. Allais, J.B. Gros, G. Trystram, A decision support system to control the aeration of sponge finger batters,
Food Control, Volume 17, Issue 7, July 2006, Pages 585-596, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.10.002.
(http://www.sciencedirect.com/science/article/B6T6S-4HRMTXY-1/2/8e8688ec5313c191eaadaa872f9295cc)
Abstract:
A pilot decision support system was developed on the basis of knowledge extraction and formalization, to help the operators to control the aeration of sponge finger batters. This system reproduces the operator's control strategies by integrating the product's sensory properties and by taking into account various operations of the entire process, which influence product quality. The system inputs are 10 sensory measurements and 4 instrumental measurements used by the operators on the production line to characterize the batter and the sponge fingers. Sensory measurements were previously formalized using the 'sensory indicators' formalism. The system outputs are the appropriate corrective actions. These actions are selected with a set of 47 'if-then' type rules which represent the formalization of the strategies developed by operators for the feedback control of aeration. The system was implemented with CLIPS, an expert systems shell, and was evaluated by comparing its outputs to the corrective actions proposed by an expert operator. Matching was obtained in 21 cases out of the 27 tested.
Keywords: Knowledge-based decision support system; Aeration; Sponge finger batter; Sensory measurements

Robbie Waugh, David J. Leader, Nicola McCallum, David Caldwell, Harvesting the potential of induced biological diversity,
Trends in Plant Science, Volume 11, Issue 2, February 2006, Pages 71-79, ISSN 1360-1385, DOI: 10.1016/j.tplants.2005.12.007.
(http://www.sciencedirect.com/science/article/B6TD1-4J0NYCG-4/2/3af6ba78614efef376bb9467133989b6)
Abstract:
For most of the past century, chemical and physical mutagens have been used in plant genetic research to introduce novel genetic variation. In crop improvement, more than 2000 plant varieties that contain induced mutations have been released for cultivation having faced none of the regulatory restrictions imposed on genetically modified material. In plant science, mutational approaches have found extensive use in forward genetics and for enhancer and suppressor screens - particularly in model organisms where positional cloning is easily achieved. However, new approaches that combine mutagenesis with novel and sensitive methods to detect induced DNA sequence variation are establishing a new niche for mutagenesis in the expanding area of (crop) plant functional genomics and providing a bridge that links discovery in models to application in crops.

Uygar Ozesmi, Can O. Tan, Stacy L. Ozesmi, Raleigh J. Robertson, Generalizability of artificial neural network models in ecological applications: Predicting nest occurrence and breeding success of the red-winged blackbird Agelaius phoeniceus,
Ecological Modelling, Volume 195, Issues 1-2, Selected Papers from the Third Conference of the International Society for Ecological Informatics (ISEI), August 26--30, 2002, Grottaferrata, Rome, Italy, 15 May 2006, Pages 94-104, ISSN 0304-3800, DOI: 10.1016/j.ecolmodel.2005.11.013.
(http://www.sciencedirect.com/science/article/B6VBS-4JRKWPY-3/2/d17de843b3c52c3f505917c186c4799d)
Abstract:
Separate artificial neural network (ANN) models were developed from data in two geographical regions and years apart for a marsh-nesting bird, the red-winged blackbird Agelaius phoeniceus. Each model was independently tested on the spatially and temporally distinct data from the other region to determine how generalizable it was. The first model was developed to predict occurrence of nests in two wetlands on Lake Erie, Ohio in 1995 and 1996. The second model was developed to predict breeding success in two marshes in Connecticut, USA in 1969 and 1970. Independent variables were vegetation durability, stem density, stem/nest height, distance to open water, distance to edge, and water depth. The nest occurrence model performance on the training data were at an average cross entropy, or concordance index (c-index), of 0.75. Within geographical region testing in two different wetlands resulted in c-indices of 0.66 and 0.53. The breeding success model performance was at a c-index of 0.75 on the training data and at c-indices of 0.47 and 0.53 for within region testing. When we tested the nest occurrence model on fledged nestling data we obtained c-indices of 0.69 and 0.47 in Clarkes Pond in 1969 and 1970, respectively, and 0.43 and 0.52 in All Saints Marsh in 1969 and 1970, respectively. When we tested the fledged nestling model on the nest occurrence data, we obtained c-indices of 0.70 and 0.41 in Stubble Patch in

1995 and 1996, respectively, and 0.54 and 0.55 for Darr in 1995 and 1996, respectively. With input variable relevances, sensitivity analyses and neural interpretation diagrams we were able to understand how the different models predicted nest occurrence and breeding success and compare their differences and similarities. Important variables for predicting nest site selection/breeding success in both models were vegetation durability and distance to open water. Both models also predicted increasing nest occurrence/breeding success with increasing water depth under the nest and increasing distance to edge. However, relationships for prediction differed in the models. Generalizability of the models was poor except when the marshes had similar values of important variables in the model, for example water depth. ANN models performed better than generalized linear models (GLM) on marshes with similar structures. Generalizability of the models did not differ in nest occurrence and breeding success data. Extensive testing also showed that the GLMs were not necessarily more generalizable than ANNs. The results from this study suggest that ANN models make good definitions of a study system but are too specific to generalize well to other ecologically complex systems unless input variable distributions are very similar.

Keywords: Artificial neural networks; Back-propagation; Modelling; Nest occurrence; Breeding success

G.A. Holt, T.L. Blodgett, F.S. Nakayama, Physical and combustion characteristics of pellet fuel from cotton gin by-products produced by select processing treatments, Industrial Crops and Products, Volume 24, Issu

The International Conference on Industrial Crops and Rural Development, November 2006, Pages 204-213, ISSN 0926-6690, DOI: 10.1016/j.indcrop.2006.06.005.
(http://www.sciencedirect.com/science/article/B6T77-4KPP473-3/2/f19849808caa4e7197c18c42d4379663)

Abstract:

Agricultural plant wastes when properly processed into useful commodities can become an economic asset. It has been estimated that over 2.04 million Mg of cotton by-products are generated each year in the United States. On average, disposal of these by-products costs the cotton gin approximately $ 1.65 (U.S.) per Mg. One means of changing a financial liability into a potential revenue generator is to process the by-products into renewable, compact pellet-type fuel that can be used at the site or transported to the consumer. Furnace and water heaters that can burn pelletized plant materials have become popular and their safety, low pollution, and reasonable operational costs have been demonstrated. Also, the drastic increases in the price of liquified fuel and its uncertain supply place a premium for finding and using alternate, low-cost, cellulose-based fuels.

The objectives of our study were to fabricate pellet fuel from cotton gin by-products using select processing techniques, determine its physical properties, and measure the emissions when fired in a commercial pellet stove used for residential heating.

By-products from two cotton gins were collected and processed into fuel pellets. A total of seven different pellet fuels were evaluated, six from cotton gin by-products and one from wood. The treatments resulted from using different material streams from the ginning process as well as varying quantities of starch and/or crude cottonseed oil

during the fuel pellet manufacturing process. The fuel pellet density from the various treatments ranged from 488 to 678 kg/m3. The various treatments were burned in a conventional pellet stove (four replications) and the gaseous and particulate emissions measured.
The average calorific value of the pellets ranged from 17.9 to 20.9 MJ/kg (HHV). The ash content for the various treatments ranged from a low of 4.88% to a high of 9.75%. The sodium content indicated concentration ranges from 91 to 282 ppm depending on the treatment.
The emissions from the cotton gin by-product pellets were higher than for a premium grade wood pellet. The emissions measured during testing were CO, NO, NO2, SO2, and particulates. The pellet stove was setup following the manufacturer's recommendation to burn wood pellets, but was not adjusted for the cotton gin fuel pellets.
By utilizing various additives and processing techniques, cotton gin by-products could be used to manufacture a pellet fuel that has commercial potential. However, work remains to minimize the ash content and determine the optimal settings for maximizing combustion.
Keywords: Pellet fuel; Cotton waste; Gin trash; By-products; Value-added processing; Pellet stove

R.H. Zhang, A.F. Mustafa, K.F. Ng-Kwai-Hang, X. Zhao, Effects of freezing on composition and fatty acid profiles of sheep milk and cheese,
Small Ruminant Research, Volume 64, Issue 3, August 2006, Pages 203-210, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2005.04.025.
(http://www.sciencedirect.com/science/article/B6TC5-4GC1RFX-1/2/ff7f71648a1e5687ca556a76954c88af)
Abstract:
A study was conducted with sheep milk to determine the effects of freezing temperature and freezing time on milk composition, cheese yield and composition and fatty acid profile of milk and cheese. Bulk tank samples of sheep milk were collected for 4 consecutive weeks and stored at -15 or -25 [degree sign]C for 1-6 months. Milk samples frozen at the two different temperatures were thawed monthly at 22 [degree sign]C and milk was used for cheese making. Results showed freezing temperature and freezing time had no effect on concentration of milk total solids, protein, casein, non-protein N, true protein and lactose contents, however, milk fat percentage decreased ($P < 0.05$) progressively during the 6 months freezing period with less changes ($P < 0.05$) observed at -25 [degree sign]C than at -15 [degree sign]C. Freezing at either temperature for more than 2 months reduced ($P < 0.05$) actual cheese yield with lowest ($P < 0.05$) yield observed at 6 months of storage, however, 37% moisture adjusted cheese yield and cheese fat and protein percentages were not affected by freezing treatments. Fatty acid composition of thawed milk and fatty acid profile of cheeses were not affected by freezing temperature and freezing time. It was concluded that freezing sheep milk at -15 and -25 [degree sign]C for up to 6 months had only minor effects on milk and cheese composition. Despite the fact that freezing reduced actual cheese yield, adjusted cheese yield was similar for all freezing treatments. Freezing had no effect on milk or cheese fatty acid concentrations. Under the conditions of this study,

good quality cheese can be produced from ovine milk frozen at -15 and -25 [degree sign]C for up to 6 months without influencing cheese yield or composition.
Keywords: Sheep milk; Freezing; Fatty acids; Cheese

A. Athimulam, S. Kumaresan, D.C.Y. Foo, M.R. Sarmidi, R.A. Aziz, Modelling and Optimization of Eurycoma longifolia Water Extract Production,
Food and Bioproducts Processing, Volume 84, Issue 2, June 2006, Pages 139-149, ISSN 0960-3085, DOI: 10.1205/fbp.06004.
(http://www.sciencedirect.com/science/article/B8JGD-4RTVVMX-7/2/a25457a3ef1c436c1c5dcad2fc1226fb)
Abstract:
Eurycoma longifolia or Tongkat Ali water extract is a valued product in the phytochemical industry. This work features the modelling and optimization of a Tongkat Ali water extract production using SuperPro Designer(R), a commercial batch process simulator. The objective of this work is to design an economically viable production scheme for a locally developed Tongkat Ali extract production process. The current pilot scale production scheme with an annual production rate of 390 kg of Tongkat Ali extract was used to simulate the base case process. Four alternative production schemes were further developed with several debottlenecking and optimization strategies. The final alternative scheme was reported to achieve a product yield of 3.00%, with an annual production of 1137.72 kg of Tongkat Ali extract. The minimum batch cycle time was reduced from 24.44 h in the base case to 8.32 h. Economic analysis determined that the proposed alternative production scheme has an annual revenue of $6.32M, with a 86% gross margin and a 55% return on investment (ROI). The payback period of this scheme was estimated to be less than two years.
Keywords: phytochemical processing; process simulation; optimization; batch processes; process debottlenecking; economic analysis

Chandrashekhar Kulkarni, Nilesh Belsare, Ashish Lele, Studies on shrikhand rheology, ***Journal of Food Engineering,*** Volume 74, Issue 2, May 2006, Pages 169-177, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2005.02.029.
(http://www.sciencedirect.com/science/article/B6T8J-4G0YT5S-2/2/ced4d2d781d351c3eb8e3d6c78376d39)
Abstract:
Shrikhand, a popular Indian dessert made from yogurt, is manufactured on an industrial scale using several chemical engineering unit operations such as mixing, filtration and heat transfer. Understanding the rheology of shrikhand is not only relevant for designing large scale mixers but can also provide quantitative means for linking the microstructure of shrikhand to its perception of texture, consistency and taste. We show here that shrikhand exhibits a combination of several rheological properties such as weak gel-like viscoelasticity, an apparent yield stress, thixotropy and long structural recovery time scales. For instance, the elastic modulus is always higher than the loss modulus over the measurable frequency range and that both moduli show only weak frequency dependence that is a characteristic of gel-like consistency. Forward and reverse rate sweep tests show a distinct hysteresis loop, which is a signature of thixotropic

character. In an attempt to trace the origins of these rheological properties in shrikhand we characterized its microstructure and showed that there exist two different microstructures: one composed of crystallites of milk fats having a length scale of ~50-100 [mu]m, and the other composed of aggregates of colloidal casein micelles of ~0.5-10 [mu]m size. Our studies show that while the temperature sensitivity of the viscoelastic parameters is dominated by the semicrystalline milk fat microstructure, the shear sensitivity is largely dictated by the protein network.
Keywords: Shrikhand; Rheology; Microstructure

R. Marino, M. Albenzio, A. Girolami, A. Muscio, A. Sevi, A. Braghieri, Effect of forage to concentrate ratio on growth performance, and on carcass and meat quality of Podolian young bulls,
Meat Science, Volume 72, Issue 3, March 2006, Pages 415-424, ISSN 0309-1740, DOI: 10.1016/j.meatsci.2005.08.007.
(http://www.sciencedirect.com/science/article/B6T9G-4H6XM85-2/2/6c38b12eaedcd8d29e77f601e5758ed3)
Abstract:
The effect of forage to concentrate ratio: 60-40 [high concentrate group (HC) and 70-30 [low concentrate group (LC)] on growth, slaughtering performance and meat quality were evaluated in twenty organically farmed Podolian young bulls. Meat quality characteristics were measured on three different muscles [Longissimus dorsi (LD), Semimembranosus (SM) Semitendinosus (ST)], vacuum-packaged and chilled stored at 2-4[degree sign]C for 15 days. The animals in the HC group had higher weight gain than those in the LC group ($P < 0.05$). Slaughter data were not influenced by ration composition. The higher forage to concentrate ratio produced an improvement in fatty acid composition of the three muscles, with a higher polyunsaturated to saturated ratio ($P < 0.001$). Vitamin E and malondialdehyde (MDA) contents were not affected by the feeding treatment. Panel scores for tenderness and flavour ($P < 0.01$) and Warner-Bratzler Shear force ($P < 0.001$) were significantly affected by muscle, the LD muscle being the most tender and the richest in flavour but they not affected by dietary treatment.
Keywords: Forage to concentrate ratio; Podolian cattle; Meat fatty acid composition; Organic farming; Meat quality

Gerd Gade, Lutz Auerswald, Heather G. Marco, Flight fuel and neuropeptidergic control of fuel mobilisation in the twig wilter, Holopterna alata (Hemiptera, Coreidae),
Journal of Insect Physiology, Volume 52, Issues 11-12, November-December 2006, Pages 1171-1181, ISSN 0022-1910, DOI: 10.1016/j.jinsphys.2006.08.005.
(http://www.sciencedirect.com/science/article/B6T3F-4KY7T8Y-4/2/3ee6e8ead50e202d28d4cd6c3b29650c)
Abstract:
The corpus cardiacum of the twig wilter Holopterna alata contains a factor that elicits increases in the concentration of lipids in the haemolymph of twig wilters and migratory locusts and causes hypertrehalosaemia in American cockroaches. A hyperlipaemic neuropeptide was isolated from corpora cardiaca of H. alata in a single high-performance liquid chromatography step. The primary sequence of this peptide was

assigned by matrix-assisted laser desorption/ionisation time-of-flight mass spectrometry, biological assay and co-elution with the synthetic peptide. The adipokinetic peptide of H. alata is an octapeptide with the sequence pGlu-Leu-Asn-Phe-Ser-Thr-Gly-Trp amide denoted Schgr-AKH-II which was sequenced previously from the corpora cardiaca of a number of Caelifera, Ensifera and some Hymenoptera. A dose of 1 pmol of synthetic Schgr-AKH-II causes a pronounced hyperlipaemic effect in the twig wilter. Physiological experiments with the twig wilter reveal that during flight periods of 3 min, the normally low carbohydrate concentration in the haemolymph is significantly diminished, whereas the lipid concentration stays constant in most cases. During a subsequent rest period of 60 min after a 3 min flight episode, however, the concentration of lipids in the haemolymph increases substantially and significantly, indicating that lipids, too, are a major fuel during flight of twig wilters. This is corroborated by the activation of the enzyme triacylglycerol (TAG) lipase in the fat body, but not in the flight muscles, by injection of 5 pmol of synthetic Schgr-AKH-II, the endogenous adipokinetic hormone that is thought to be released during flight.
Moreover, in the thorax there is a significant decrease in the concentration of glycogen and lipids measured after flight plus 60 min of rest compared to non-flown twig wilters, whereas no significant changes were monitored for these substrates stored in the abdomen. When the change in lipid class composition was analysed during flight plus 60 min of rest, TAG which comprised the major class in all compartments analysed (thorax, abdomen, haemolymph) was significantly reduced in abdomen and thorax, and diacylglycerol was significantly increased in all three compartments. From all the data collected, it is concluded that lipids are the major fuel class for flight in H. alata and that the contribution of carbohydrates is minimal.
Keywords: AKH peptides; HPLC; Flight metabolism; Lipase activation; Heteroptera; Twig wilter

Omprakash Mittapalli, Ian L. Wise, Richard H. Shukle, Characterization of a serine carboxypeptidase in the salivary glands and fat body of the orange wheat blossom midge, Sitodiplosis mosellana (Diptera: Cecidomyiidae),
Insect Biochemistry and Molecular Biology, Volume 36, Issue 2, February 2006, Pages 154-160, ISSN 0965-1748, DOI: 10.1016/j.ibmb.2005.11.004.
(http://www.sciencedirect.com/science/article/B6T79-4HRN3FW-1/2/55f95b6c36bf74eb4f3b77300861f9f7)
Abstract:
A full-length cDNA encoding a serine carboxypeptidase (designated SmSCP-1) was recovered from an ongoing salivary gland EST project of the wheat midge. The deduced 461-amino acid sequence had a putative signal sequence at the amino terminus, indicating it was a secreted protein. The protein shared homology with serine carboxypeptidases from other insects, mammals, plants, and yeasts. SmSCP-1 mRNA was expressed in all stages of development and detected in salivary gland and fat body tissues but not in midgut tissue. Expression analysis and quantitative real-time PCR assays in male and female wheat midges and the fat body tissue of adult midges revealed that SmSCP-1 was up-regulated nearly four-fold in the female midges compared to males and nearly two-fold in female fat body compared to male fat body. The wheat midge serine carboxypeptidase (SmSCP-1) most likely has a dual function.

As a secreted digestive enzyme, it could play a role in mobilizing host-plant seed reserves for feeding larvae and as expressed in fat body could function as an exopeptidase in degradation of vitellogenin and/or in post-translational processing of other enzymes.

Keywords: Wheat midge; Sitodiplosis mosellana; Salivary glands; Fat body; Serine carboxypeptidase; Wheat

Anders Kiessling, Lars Helge Stien, Oivind Torslett, Jorma Suontama, Erik Slinde, Effect of pre- and post-mortem temperature on rigor in Atlantic salmon muscle as measured by four different techniques,
Aquaculture, Volume 259, Issues 1-4, 8 September 2006, Pages 390-402, ISSN 0044-8486, DOI: 10.1016/j.aquaculture.2005.11.008.
(http://www.sciencedirect.com/science/article/B6T4D-4KGPP83-1/2/9cd32986107815eb8f1cda1828b1cb3e)

Abstract:
The effects of ante- and post-mortem temperature regimes on the timing and strength of the rigor process in muscle of Atlantic salmon (Salmo salar) were measured by four frequently used methods for assessment of rigor. The methods were isometric tension (IT, Newton) in excised muscle strips measured by a Rigotech(R) meat analyzer, whole fillet contraction (WFC, percentage shrinkage) by automatic image analysis, changes in muscle hardness (H, Newton) by compression with a spherical probe and stiffness (S, percentage of full bend) measured by tail bending (also known as 'Rigor index'). The fish were moved into experimental temperature tanks 10 days prior to slaughter. The temperature was either kept constant at 4 or 12 [degree sign]C, or changed from 12 to 4 [degree sign]C 2 h before slaughter. Storage (post-mortem) temperature was set to 4, 12 or 20 [degree sign]C. Maximum IT, H and S decreased in response to higher storage temperature ($p < 0.0001$), while WFC increased ($p < 0.0001$). The occurrence in time of maximum value differed between methods, with chronological succession; IT-->WFC-->S-->H. The rigor process was always delayed when storage temperature was reduced ($p < 0.0001$). The effect of ante-mortem temperature was more complex. At the same storage temperature (4 [degree sign]C), fish that had been moved from 12 to 4 [degree sign]C 2 h before slaughter had a significantly more rapid rigor process than fish that were kept at a constant temperature before slaughter ($p < 0.0001$), possibly indicating an effect of stress when changing water temperature. General agreement between treatments and relative response was observed among the four methods. Even so, significant differences were seen, especially in the resolution power of treatment effects, with IT > WFC > H > S.

Keywords: Salmon; Pre-rigor filleting; Storage temperature; Rigor measurements

Lawrence A. Lacey, Steven P. Arthurs, Thomas R. Unruh, Heather Headrick, Robert Fritts Jr., Entomopathogenic nematodes for control of codling moth (Lepidoptera: Tortricidae) in apple and pear orchards: Effect of nematode species and seasonal temperatures, adjuvants, application equipment, and post-application irrigation,
Biological Control, Volume 37, Issue 2, May 2006, Pages 214-223, ISSN 1049-9644, DOI: 10.1016/j.biocontrol.2005.09.015.

(http://www.sciencedirect.com/science/article/B6WBP-4HGM79M-1/2/3cf7a838463e0b1e86fc813bc8295ca5)

Abstract:
Codling moth (CM), a serious pest of apple and pear in most countries where these fruits are grown, overwinters in cryptic habitats as cocooned diapausing larvae. Control of diapausing CM larvae would reduce or eliminate damage to fruit early in the following growing season. Entomopathogenic nematodes (EPNs) have shown promise as biological control agents of cocooned CM larvae in the Pacific Northwest and elsewhere, but several factors, such as choice of EPN species and other operational factors warrant investigation to provide growers with practical control options. Field trials with Steinernema carpocapsae and S. feltiae were conducted in apple and pear orchards to determine the effects of seasonal temperatures, adjuvants, post-application irrigation, and method of application on control of cocooned CM larvae. In studies conducted in late summer, fall and early spring (1999-2000), EPNs were applied to apple trees (Golden Delicious) with a backpack sprayer at a rate of 106 infective juveniles (IJs)/tree plus supplemental wetting to aid survival of IJs. Good control by both EPN species was observed in September (94-95% mortality in sentinel CM larvae). In October, control by S. feltiae was also effective (90% mortality), but S. carpocapsae was less effective (58% mortality), ostensibly due to the cooler conditions. In identical applications the following spring, the efficacy of S. carpocapsae and S. feltiae was reduced during cool windy conditions in March 30 tests, providing 26 and 65% control of sentinel larvae, respectively, but improved during warmer conditions in April 12 tests (71 and 86% control, respectively). In further tests in the same location in mid-October 2001, S. feltiae (106 IJs/tree) were most effective for control of sentinel CM larvae cocooned in cardboard strips ([approximate] 80% mortality) and logs (34-47%) when combined with a wetting agent (Silwet L77) or a humectant (Stockosorb) and the trees were misted for 4 h post-treatment. In the absence of post-application wetting, the addition of either adjuvant (Silwet and Stockosorb) to IJs also increased larval mortality in strips, although it did not significantly improve nematode efficacy on logs. In another test in late summer 1999, the use of a lance applicator (applying 2.0 x 106 IJs/tree) did not significantly improve control of cocooned larvae for either EPN species, when compared with a tractor-mounted airblast sprayer. Two further tests in the fall of 2003 with S. carpocapsae and S. feltiae compared post-application wetting with existing and modified irrigation in 4-year-old trellised apple (Gala) and established Bartlett pear orchards. No significant improvements in sentinel larval mortality were observed following application of both EPN species with an airblast sprayer (1-2.5 x 109 IJs/ha) when conventional overhead rotator sprinklers were replaced with lower volume microsprinklers.

Keywords: Entomopathogenic nematodes; Codling moth; Cydia pomonella; Steinernema feltiae; Steinernema carpocapsae; Temperature effect; Irrigation effect; Application effect

D. Karayel, M. Wiesehoff, A. Ozmerzi, J. Muller, Laboratory measurement of seed drill seed spacing and velocity of fall of seeds using high-speed camera system,
Computers and Electronics in Agriculture, Volume 50, Issue 2, February 2006, Pages 89-96, ISSN 0168-1699, DOI: 10.1016/j.compag.2005.05.005.

(http://www.sciencedirect.com/science/article/B6T5M-4HHH4SN-2/2/53422df951f04c9fecd1079c64be5774)

Abstract:
Due to the individual volumes of fluted wheel metering systems each holding more than one seed, seed drills provide random seed distribution. A prerequisite for the improvement of seed spacing is the fast and reliable evaluation of distribution accuracy in laboratory tests.
A high-speed camera system for evaluating seed spacing uniformity and velocity of fall of seeds is described. The performance of the high-speed camera system in terms of seed spacing evaluation was compared with a sticky belt test stand, used as a reference. Identical seed patterns were evaluated applying both methods simultaneously using wheat and soybean seeds. The speed of the metering rollers of the seed drill was set at 10, 20, 30 and 40 rpm and that of the seed drill at a simulated travelling speed of 1 m/s.
In general, the high-speed camera system worked well in obtaining the seed spacing and velocity of fall of seeds. In all the tests with the wheat and soybean seeds, the high-speed camera system did not miss any seed.
The sowing uniformity of the seed drill as investigated was affected by the speed of the metering rollers. Coefficient of variation of seed spacing, velocity of fall and coefficient of variation of velocity of fall of seeds decreased as the speed of the metering rollers increased.

Keywords: High-speed camera; Seed drill; Sowing; Vision; Sticky belt

Tobias Merkle, Martin Rost, Wolfgang Alt, Egocentric path integration models and their application to desert arthropods,
Journal of Theoretical Biology, Volume 240, Issue 3, 7 June 2006, Pages 385-399, ISSN 0022-5193, DOI: 10.1016/j.jtbi.2005.10.003.
(http://www.sciencedirect.com/science/article/B6WMD-4HM7S96-2/2/04431ec3d75d1d4cf833098ad20f3fbd)

Abstract:
Path integration enables desert arthropods to find back to their nest on the shortest track from any position. To perform path integration successfully, speeds and turning angles along the preceding outbound path have to be measured continuously and combined to determine an internal global vector leading back home at any time. A number of experiments have given an idea how arthropods might use allothetic or idiothetic signals to perceive their orientation and moving speed. We systematically review the four possible model descriptions of mathematically precise path integration, whereby we favour and elaborate the hitherto not used variant of egocentric cartesian coordinates. Its simple and intuitive structure is demonstrated in comparison to the other models. Measuring two speeds, the forward moving speed and the angular turning rate, and implementing them into a linear system of differential equations provides the necessary information during outbound route, reorientation process and return path. In addition, we propose several possible types of systematic errors that can cause deviations from the correct homeward course. Deviations have been observed for several species of desert arthropods in different experiments, but their origin is still under debate. Using our egocentric path integration model we propose simple error

indices depending on path geometry that will allow future experiments to rule out or corroborate certain error types.

Keywords: Path integration; Desert arthropod; Egocentric; Cartesian coordinates; Homing

Massimo Bertolini, Maurizio Bevilacqua, Roberto Massini, FMECA approach to product traceability in the food industry,

Food Control, Volume 17, Issue 2, February 2006, Pages 137-145, ISSN 0956-7135, DOI: 10.1016/j.foodcont.2004.09.013.
(http://www.sciencedirect.com/science/article/B6T6S-4DVBHXF-8/2/a94011f591aae33a3ba9d5774c11b121)

Abstract:
The traceability system in the farming and food supply chain can be described as the documented identification of the operations which lead to the production and sale of a product. Its objective is to identify the actors involved and trace the relevant flows, precisely characterizing the material and processing or management operations that contribute to the production of the final items. The traceability system must be efficient and effective, accurately collecting the necessary information and enabling a rapid and correct reuse of this information.
This paper presents an application of the industrial engineering tool `Failure Mode Effect and Criticality Analysis' (FMECA) to the production process in the farming and food industries, as this tool is aimed at detecting the possible critical points of its traceability system (whether in use or undergoing implementation), and at proposing improvements.

Keywords: Food traceability; Food safety; Failure Mode Effect and Criticality Analysis (FMECA)

Solomon Gebregziabher, Abdul Mounem Mouazen, Hendrik Van Brussel, Herman Ramon, Jan Nyssen, Hubert Verplancke, Mintesinot Behailu, Jozef Deckers, Josse De Baerdemaeker, Animal drawn tillage, the Ethiopian ard plough, maresha: A review,

Soil and Tillage Research, Volume 89, Issue 2, September 2006, Pages 129-143, ISSN 0167-1987, DOI: 10.1016/j.still.2005.08.010.
(http://www.sciencedirect.com/science/article/B6TC6-4HBSGPS-1/2/7198fb5b9d73a16b8dd00a9ea37cd86b)

Abstract:
Although the development of animal drawn tillage tools in the world has been on the agenda for thousands of years, there is still room for their improvement. The present study attempts to give an overview of previous works toward development of animal drawn tillage tools and to identify the areas having most potential for future improvement. The socio-economy, natural resource situation, historic perspective of animal traction in eastern and southern Africa and more specifically the ard plough history in Ethiopia are presented. The design, construction, performance and attempts done since 1939 for the improvement of the ard plough in Ethiopia are also presented. Moreover, trials towards the development of appropriate farm implements for Vertisols management, i.e. the broad bed maker (BBM) were also surveyed. From the review, it can be concluded that previous developments in animal traction tillage implements

relied on cultural, trial and human experience. With the recent development in farm technologies and mathematical modelling techniques supported by computer-based simulations, new methodologies in research are available to improve animal traction tillage implements. When adopted, these methodologies could significantly assist in optimising the implement designs and operational conditions aiming at minimum draught requirement and best soil manipulation performance.

Keywords: Maresha; Ard plough; Broad bed maker (BBM); Vertisols management; Animal traction; Review

Anne Mottet, Sylvie Ladet, Nathalie Coque, Annick Gibon, Agricultural land-use change and its drivers in mountain landscapes: A case study in the Pyrenees,
Agriculture, Ecosystems & Environment, Volume 114, Issues 2-4, June 2006, Pages 296-310, ISSN 0167-8809, DOI: 10.1016/j.agee.2005.11.017.
(http://www.sciencedirect.com/science/article/B6T3Y-4J0WR64-2/2/27bfdbcb7036bd404e7a020334d085b5)

Abstract:
Research studies aimed at integrating socio-economic and geo-bio-physical factors are increasingly being used in order to improve our understanding of the causes and effects of land-use change and to support sustainable landscape development. In line with such approaches, the study reported in this paper addresses land-use change and its drivers in the peripheral area of the Pyrenees National Park (PNP), France. The focus is land-use change on private farmland currently utilised by the farmers. The method relies on a Geographic Information System (GIS), including a digital terrain model, a digital cadastre map and a farm survey addressing current and past land use. For every parcel of land, data on current land-use practices and land-use histories since 1950 were collected during interviews with the farmers. An increase in land-use intensity occurred on some of the parcels in the late 1980s and 1990s, in contrast with the global processes of abandonment or extensification since the early 1960s. This intensification process appears to be related not only to the application of agri-environmental policies but also to specific local factors, in particular to the building of an access road to the highest part of the village. The respective roles of bio-physical factors (slope and elevation) and farm socio-economic factors (farmland spatial pattern, land-tenure system) on land-use change at parcel level have also been investigated. The impact of slope and elevation on land-use type appears overall to have been greater in 2003 than in 1950. However, these factors impact differently according to the types of landscape unit: they are not determining factors in the units remote from the village, but they do have an important role in the units close to the village. The distances of the parcels from the farmstead and their access facilities appear to be the two major farm-related factors in the local context. These results confirm the important role of land-management units' spatial arrangement in land-use dynamics and landscape change, as has already been found in other regions. They are seen as a valuable addition to studies aimed at supporting sustainable management of traditional mountain landscapes for multifunctional purposes.

Keywords: Land-use change; Land-use history; Farming systems; Socio-economic and bio-physical drivers; Land management practices; Spatial patterns; Agricultural landscape; Mountain