

Barbara BURLINGAME



Current position:

Senior Officer and Leader of the Nutrition Requirements and Assessment Group
Food and Agriculture Organization of the United Nations
Rome
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BIOGRAPHY

Dr. Barbara Burlingame is the Senior Officer and Leader of the Nutrition Requirements and Assessment Group for the Food and Agriculture Organization of the United Nations (FAO). Her areas of responsibility include food composition, human nutrition requirements, dietary and nutritional risk assessments, the cross-cutting initiative on biodiversity for food and nutrition, and provision of scientific nutrition advice to member nations and the Codex Alimentarius Commission. Since 1995 she has been the director of INFOODS, the International Network of Food Data Systems. In addition, she is a member of the Board of Editors in the Life Sciences, Chairperson of the International Union of Nutritional Sciences Food Data Task Force, recipient of the New Zealand Royal Society's Science and Technology Medal, and a member of several scientific advisory boards. She has authored many scientific papers and UN publications, and several book chapters and reference books, and has served in the role of Editor and Editor-in-Chief, and on the Editorial Boards of several journals during the last 25 years.

Dr Burlingame studied at the University of California, Davis, and obtained her Bachelor of Science degree in Nutrition Science and Environmental Toxicology. She did her postgraduate work in New Zealand at Massey University where she obtained her PhD.

From 1987-1998 she worked for the New Zealand Institute for Crop & Food Research, and since 1998 she has worked for the FAO.

ABSTRACT

SUSTAINABLE DIETS: NUTRITION AS AN ECOSYSTEM SERVICE (L1)

Barbara Burlingame, Sandro Dernini

Food and Agriculture Organization of the United Nations, Rome, Italy

Organic agriculture, as defined by FAO, is a system that relies on ecosystem management rather than external agricultural inputs, and food is an ecosystem service. The link between organic agriculture and human health and nutrition requires consideration of not just food, but the more complex issue of the diet as a whole. Even as fast food and soft drink consumption leads to childhood obesity at staggering levels all over the world, and as global food production squeezes ever-higher yields out of the three crops that provide more than half the planet's dietary energy supply, and as micronutrient malnutrition is increasingly addressed through pharmaceutical and therapeutic preparations, the wider nutrition community began pondering possibility that food and nutrition security could be considered an ecosystem service. At the same time, the governing body of the Convention on Biological Diversity requested that FAO, together with partners, implement a cross-cutting initiative on biodiversity for food and nutrition. Thus was the formal coming together of the sectors of agriculture, environment, and health, embarking on a common path with nutrition as the central element. By the end of 2010, a series of events, both technical and intergovernmental, had led to a platform for action, a proposal for a code of conduct and a consensus definition for sustainable diets, as follows:

Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.

As such, sustainable diets as a concept should be considered the logical extension to organic agriculture.

Significant background events and papers will be discussed including the FAO Regional Conferences for Europe, the AFROFOODS Call for Action from the House of the Slaves, the Mediterranean Diet as a Model for Sustainable Diets, Traditional Food Systems of Indigenous Peoples, and the results of the survey on Sustainable Diets.

Urs NIGGLI



Current position:

Executive Director
Research Institute of Organic Agriculture (FiBL)
Switzerland

BIOGRAPHY

Urs Niggli is Executive Director of the Research Institute of Organic Agriculture (FiBL) in Switzerland since 1990. His professional background is crop scientist with a PhD in weed management at ETH Zurich. He teaches selected topics of sustainable agriculture and organic farming at the university of Kassel/Witzenhausen as honorary professor. Urs Niggli is member of the board of the International Federation of Organic Agriculture Movements (IFOAM); of the scientific board of the German Federal Johann Heinrich von Thünen Institute; of the board of directors of the International Centre for Research in Organic Food Systems (ICROFS) in Denmark; of the advisory board of the German Institute for Tropical and Subtropical Agriculture (DITSL); member of the agricultural Senate Commission of the German Research Foundation (DFG); member of the board of directors of the inspection and certification company bio.inspecta inc..

He has published 200 papers and articles in scientific journals, in conference proceedings, books and magazines.

ABSTRACT

PROCESS AND PRODUCT RELATED ASPECTS OF ORGANIC FOOD QUALITY - FROM BIODIVERSITY TO HUMAN NUTRITION (L2)

Urs Niggli

Forschungsinstitut für Biologischen Landbau, Frick, Swiss

Agriculture is challenged to reduce trade-offs between the fast growing demand for food, negative impacts on the environment, overexploitation of natural or non-renewable resources, and quality aspects of food such as safety, nutritional value and ethical standards. Therefore, any concepts on how to best farm land, rear livestock and process, package, transport and market foods have to be assessed against a comprehensive set of criteria. In a multifunctional perspective, organic agriculture and food production performs conclusively well.

Among a growing number of food schemes and labels claiming sustainability, organic has a sound scientific evidence of the actual (real-life) ecological, social and livelihood impacts. A most recent FiBL meta-analysis of 315 scientific papers listed 240 for organic farming (of which 89 % are peer-reviewed), the other papers cover sustainability aspects of all the other labels such as FairTrade, Rainforest Alliance and three others.

The real strengths of organic farming are synergies between otherwise conflicting objectives: Best organic farming practice improves soil fertility and as a result of this stabilizes yields, optimizes food quality and abates global warming. It's productivity increase is grounded on the careful use of ecosystem services including inter and intra-species diversity. Resilience or robustness is an inherent quality of organic cropping and livestock systems which benefits quality, safety and authenticity of foods. The lecture will give examples and data of such synergies between process and product quality. It also highlights that organic agriculture is multifunctional in its nature as it produces not only commodities but also many non-commodity outputs such as environmental services, landscape amenities and cultural heritages.

David R. JACOBS



Current position:

Professor of Public Health
Division of Epidemiology and Community Health
School of Public Health
University of Minnesota
Minneapolis, USA

Guest Professor
Department of Nutrition
School of Medicine
University of Oslo
Oslo, Norway

BIOGRAPHY

David R. Jacobs, Jr., PhD, holds the degree of Ph.D. in Mathematical Statistics (1971) from The Johns Hopkins University. He has been on the faculty of the School of Public Health, University of Minnesota since 1974, and has held the rank of Professor of Epidemiology since 1989. He concurrently holds a guest professorship at the Department of Nutrition at the University of Oslo, Norway (1999-present). He is a fellow of the American Heart Association and the American College of Nutrition. He serves on the editorial boards of the British Journal of Nutrition, Clinical Chemistry, and Preventive Medicine.

He has written over 700 articles on various topics concerning the epidemiology of chronic diseases and their risk factors, including the epidemiology of specific molecules, and particularly those relating to cardiovascular diseases and diabetes. Topics of interest include monitoring of cardiovascular disease and its risk factors, the relation of high cholesterol with atherosclerotic diseases and the relation of low cholesterol with nonatherosclerotic diseases; measures related to oxidative stress and damage, serum antioxidant vitamins, gamma glutamyl transferase, plasma F2-isoprostanes, C-reactive protein, adiponectin, persistent organic pollutants, and arterial elasticity. Since 1994, he has focused extensively on whole grain intake and health. His work was influential in the 2000 decision of the USDA Dietary Guidelines Advisory Committee to add a specific guideline to "eat a variety of grains, especially whole grains", and in the strengthening of this message in the 2005 USDA Dietary Guidelines. Recent work has included study of periodontal disease, as a model of infectious disease, and its implications for cardiovascular disease. He has published intriguing cross-sectional findings relating background exposure of persistent organic pollutants to diabetes. He has written several articles on the health implications of synergies of different plant foods and dietary patterns.

Potential conflicts of interest: US National Institute of Health grants. Unpaid consultant, California Walnut Commission. Paid consultant, insurance industry.

ABSTRACT

FOOD, NOT NUTRIENTS, IS THE FUNDAMENTAL UNIT IN NUTRITION (L3)

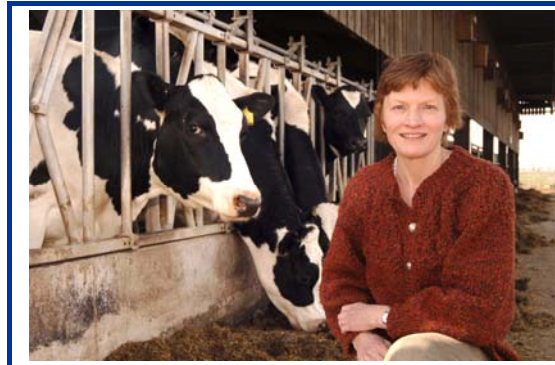
David Jacob

University of Minnesota, USA

In the concept of “food synergy” food was once alive and consists of a harmonious biochemical constitution (due to evolution), suitable for the life of the organism eaten. Some aspects of that harmony survive digestion and become systemic in the eater. The health effect of eating food is synergistic, in the sense that the effect of the composite is greater than or equal to the sum of the effects of the constituents, were they eaten in isolation. Under the concept of food synergy, food should be more healthful than isolated constituents (supplements). Both long term observational studies and clinical trials find no difference in clinical outcomes and death in supplement users for most supplements; some even find adverse clinical outcomes in supplement users. In contrast, one of the most consistent findings in nutritional epidemiology is the positive association of certain food patterns that are rich in diverse phytochemicals with better health and fewer new clinical events. The nutrient concept, as a guiding principle for healthy eating, seems most helpful in the case of deficiency diseases, but may be misleading when the diet is generally adequate. The best bet for health is to eat food rich in biologically active constituents, prepared for maintaining maximal biological activity.

TOPIC: Quality and Safety of Organic Plant and Animal Products

Gillian BUTLER

**Current position:**

Livestock Project Manager
Nafferton Ecological Farming Group
Newcastle University
UK

BIOGRAPHY

Gillian Butler acts currently at the position of the Livestock Project Manager at Nafferton Ecological Farming Group at Newcastle University in UK. Gillian has worked with livestock farmers for over 30 years largely offering nutritional advice to optimise production and quality. Her research interests consider management under organic and low input dairy production and their effect on milk quality, initially under the QualityLowInputFood project and continuing under another EU project LowInputBreeds. She is also closely involved with local Organic Producers and is a member of the Soil Association Producer and Grower's Board.

ABSTRACT

USING HUSBANDRY TO IMPROVE DAIRY PRODUCT QUALITY (L4)

Gillian Butler

Livestock Project Manager, Nafferton Ecological Farming Group, Newcastle University, Nafferton Farm, Northumberland, NE43 7XD, gillian.butler@ncl.ac.uk


There is growing evidence that organic dairy products are better for us compared to those from conventional production. However, the higher levels of beneficial unsaturated fatty acids and antioxidants they contain do vary throughout the year and also between farms and countries: organic milk is not always *better*.

Findings will be presented to show the increase in these beneficial fatty acids (and hence a reduction in potentially harmful saturated fatty acids) is linked directly to cows grazing rather than a diet with silage or concentrates. Furthermore, if this grazed forage is grown in the absence of nitrogen (and likely to have a high proportion of clover?) the omega 3 fatty acids are boosted more than other unsaturated fatty acids. Work is also investigating feeds that potentially can be used to maintain summer quality in the winter and comparative trials have shown the response to this approach is also greater under organic rather than conventional management.

We now have good indication of management necessary to optimise the fatty acid profile in milk and organic management is a great start, although there might be scope for further improvement.

TOPIC: Impact of Processing on Organic Quality and Safety

Ursula KRETZSCHMAR

	<p>Current position: Senior Scientist Forschungsinstitut für Biologischen Landbau (FiBL) Frick Switzerland</p>
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BIOGRAPHY

Ursula Kretzschmar (Senior Scientist MSc ETH Food Engineer) has been working for FiBL Switzerland since 2004, where she is in charge of food processing issues with regard to organic products. Ursula Kretzschmar is co-ordinating the running EU Project ECROPOLIS started in January 2009. In the Core organic Eranet project QACCP started in June 2007 she is responsible for the co-ordination of WP 9 (implementation in quality management systems, recommendation and dissemination) and engaged in WP 2 (consumers and processors awareness and acceptance) as well as WP 3 (QACCP Processors) and WP 8 (Quality definition). In the EU project "Improving quality and safety and reduction of cost in the European organic and "low input" food supply chains (QualityLowInputFood)" she has been assigned as the responsible WP co-ordinator for the subprojects WP 5.1, 5.2 and 5.3 concerning food processing and law. She has 5 years practical experience in the food industry in sales, product development and quality management. For 3 1/2 years, she was head of the department processing and trade at BIO SUISSE, the Swiss umbrella organisation for organic farming. She served as a member of the Commissions for Food Law of FIAL and Biscofa for 5 years. She has also experience in inspection and certifying of organic food. Since November 2005, she is member of the Commission for Organic Food Processing and Trade of BIO SUISSE and member of the Arbeitskreis Qualität Alnatura DE.

ABSTRACT

ORGANIC FOOD PROCESSING - WHERE ARE WE, WHERE COULD WE GO? (L9)

U. Kretzschmar^{1*}, Otto Schmid¹ and Dr. Alexander Beck²

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Many consumers as well as processors expect that organic food should be processed differently as conventional. The EU Regulation (EC) 843/2007 and the implementation rules EC Regulation 889/2009 cover a number of consumer perceptions regarding organic food processing like the use of organic raw materials, minimal use of additives, yearly certification, traceability and labelling concepts. In 2007 the EU Council Regulation (EC) 834/2007 established for the first time also principles for organic food processing.

Furthermore the exclusion of processing methods that might mislead regarding the true nature of the product or do not guarantee and maintain the integrity of the organic product are core principles in the EC Regulation 834/2007. But this raises a number of fundamental questions:

To use deep frozen vegetables for a sterilized vegetable salad: is this misleading regarding the true nature of the product? Is such a product processed with care?

Regarding the choice of processing methods there is still no overall theoretical quality concept. More and more processing methods are already used which may be not in compliance with the principles of organic agriculture! Clear guidelines on product specific level for the evaluation of gentle/careful processing methods should be developed in close collaboration between the private sector, competent authorities, EU commission and the research.

With the possibility to produce additives of agricultural sources in certified organic quality new questions arose: are the established requirements for organic products sufficient for "organic additives"?

Is it still a goal to strive for the minimal use of additives or are organic additives like organic wheat starch or organic soya lecithin equal to the use of organic ingredients? Is the principle of "essential technological need" still valid when using more and more "organic" additives?

In addition organic products have to meet further environmental or sustainable criteria. Evaluating the ecological performance of an operation requires management procedures which generate relevant data on environmental parameters: an environmental management system. The organic sector should therefore discuss how to enable operators to install such procedures in the best way.

Fair trade is an equally important issue belonging to sustainability, but is still at a more experimental stage in the developed countries, contrary to already long-time introduced concepts in third world countries. Fair trade between farmers, transport organisations, processors and traders became more and more relevance.

Last but not least the transparency is a major topic with regard to processing. May be new concepts for communicating with consumers must be developed, for example the environmental performance as well as careful processing methods of organic products needs to be communicated!

Key words: organic food processing, naturalness, additives, processing methods, authentic, transparency

Acknowledgement: *We acknowledge the Commission of the European Communities as well as the Swiss Federal Office for Education and Science (BBW) for their financial support of the project QualityLowInputFood.*

TOPIC: Organic Food Quality Concepts

Angelika PLOEGER



Current position:

Head of the Department Organic Food Quality and Food Culture
Faculty of Organic Agricultural Sciences
Kassel University
Germany

BIOGRAPHY

Angelika Ploeger (Prof. Dr. Dr. h.c. mult.) is Head of the Department Organic Food Quality and Food Culture, Faculty of Organic Agricultural Sciences at Kassel University, Germany. She studied Food Science and Nutrition at University of Gießen where she finished her PhD in 1978 and worked there as a post doc before she went in 1981 to take a position in a Swizz Company (branch in Germany) for 3 years.

Since 1984 she has been elected as Professor at different Universities (University of Applied Sciences in Mönchengladbach and from 1986 to 2001 at Fulda since 10/2001 at Kassel/Witzenhausen).

She is board member of International Association for Science of Food Culture (IAKE), Scientific Advisory Board of BÖLW (German league for organic food production) and at the Scientific Advisory Board of the Federal Ministry for Food, Agriculture and Consumer protection (Berlin). Topics of research and lecturing: Food Quality with special focus on organic, sensory science and product development, food culture and education.

ABSTRACT

QUALITY CONCEPTS OF ORGANIC FOODS FROM PAST TO FUTURE (LW1)

Angelika Ploeger

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In the past quality concepts for food included nutrition as an important part of a lifestyle linked to personal values and a concept of health. Examples for this are food quality concepts in ancient Chinese or Indian medicine such as TCM (Traditional Chinese Medicine) or Ayurveda (Sanskrit scripts). In Greek language “*diaita*” included all measures (sports, food, nutrition, lifestyle) supporting human health (body and soul). Today the meaning of “*diet*” has changed and is mainly focusing on nutrients to support the human metabolism. Today nutrigenomics/ metabolomics are research areas where a lot of money is spent to understand an individual health supporting nutrition. Therefore fortification of food is a logical development in food industry.

In Europe especially in the 1920 to 1950 (period of industrialization) a new so called “Reform movement” tried to link nature and food to human health and life style (e.g. in Switzerland Dr. Bircher- Benner, in Germany Rudolf Steiner, Werner Kollath, in Great Britain Sir Albert Howard and Lady Eve Balfour). They all shared the antagonism to intervention that caused “denaturing” of food such as artificial, synthetic fertilizers for farming or “industrial” food processing changing the value of food for human health. Lady Eve Balfour claimed a memorable concept of health: “health, whether of soil, plant, animal and man is one and indivisible” (Balfour, 1943 p. 28). She called that the “natural cycle”. According to her opinion the quality of soil should be transmitted to plants and then to animals or man directly. Has this assumption been proven? Is it still valid? Thinking of organic food today the question is if there is still the “concept” of linking nature, food and human health?

This paper focuses on today’s understanding of human health and “nutrition”, how quality is defined in Europe in general and if there is still a different understanding of food quality for organic foods? Do we see “a quality concept” when we are looking deeper into the regulations for organic agriculture and organic food processing? Do people expect a “plus” for their health purchasing organic food and how can we interpret Lady Eve Balfour’s concept today?

TOPIC: Standardization of Novel Methods

Nicolaas BUSSCHER

 A portrait photograph of Nicolaas Busscher, a middle-aged man with short, light-colored hair, wearing a light blue button-down shirt. He is looking slightly to the right of the camera. The background is a blurred outdoor setting with green foliage.	<p>Current position: Head of group Food Quality University of Kassel Germany</p>
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BIOGRAPHY

1983 - Hamburg: University, Diploma in Physics, Title Dipl. Phys

1986 - Hamburg: University, Phd. Graduation, Titel Dr.rer.nat

1986-1989 - Stuttgart, Mercedes Benz: pre-development electronics

1989-2001 - Denmark: Working on the CuCl₂ Method with Jens-Otto Andersen

since 2001 - University of Kassel: Head of group Food Quality (together with J.Kahl)

ABSTRACT

THE BIO-CRYSTALLIZATION METHOD AS A NEW INDICATOR FOR ORGANIC FOOD-QUALITY (L11)

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¹ Department of Organic Food Quality and Food Culture, Institute of Organic Agriculture/ University of Kassel, Kassel, Germany

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Crystallization patterns emerge when an aqueous di-hydrate copper chloride ($\text{CuCl}_2 \cdot 2 \text{H}_2\text{O}$) solution with the sample in question (e.g., a watery extract of food products) is crystallized on a glass plate. The laboratory procedures are described in standardized protocols. The patterns can be evaluated according to standardized evaluation methods. The standardization of the bio-crystallization method for organic food quality has been reported for carrots and milk (Kahl et al. 2009, Busscher et al. 2010a). Furthermore samples from different treatments (e.g. farming practices) could be significantly discriminated based on the texture analysis of the emerged crystal pictures (Szulc et al. 2010). In order to apply the bio-crystallization on food samples in addition to authentication issues, the relation of the emerging picture and its textural and structural features with food quality criteria and/or indicators has to be elaborated. Therefore the building process of the emerging picture needs to be understood more deeply according to its physical and chemical properties. The factors of influence of the evaporation- and crystallization process of the bio-crystallization in the presence of an additive (like a food sample) has been studied (Busscher et al. 2010b, Busscher et al. 2011). As a result of this investigations a negative process-entropy and the hypothesis of self organization characteristics were formulated. A negative process entropy and self-organization abilities may help to explain that pictures with a structure emerge. Based on this the hypothesis for the building process of the bio-crystallization picture can be formulated that the emerging picture is influenced by those properties of the additive, which are influencing the process-entropy and the self-organization. This would be a hypothetical basis for the connection of food quality with the concept of structure.

Key words: bio-crystallization, pattern, self organization

TOPIC: Organic Food Authenticity

Saskia VAN RUTH

Current position:

Head of the Research Cluster Authenticity and Nutrients
Manager of the Research Programme Product Composition
RIKILT – Institute of Food Safety
Wageningen University and Research Centre
Netherlands

BIOGRAPHY

Dr. Saskia van Ruth heads the Research Cluster Authenticity and Nutrients, and manages the Research Programme Product Composition at RIKILT – Institute of Food Safety, Wageningen University and Research Centre in the Netherlands. She received her PhD in Food Chemistry from the Wageningen University in 1995 and carried out research as post-doctoral researcher for Unilever on lipid and volatiles chemistry in 1996-1998. From 1998 till 2005 she worked on instrumental flavour research as senior scientist in University College Cork, Ireland and lectured sensory science and related analytical chemistry. Subsequently she joined RIKILT in 2005. Her research interests concern complex authentication issues with regard to production system (organic, sustainable, halal), geographical origin, processing, ingredients, and typicality (artisanal products) with application of state-of-the-art analytical methodology in combination with chemometrics. She has published 150+ scientific papers, and participated in numerous national, EU and global projects / committees / networks.

ABSTRACT

2011 APPROACHES FOR ORGANIC FOOD AND FEED AUTHENTICATION (L14)

S. van Ruth*, M. Alewijn, A. Tres and G. van der Veer

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People's growing awareness of health, environment and animal welfare has led to an increased public interest in the quality of foods and food production systems. This in turn boosted organic production. Due to higher production costs, organic produce tends to retail at a higher price than their conventional counterparts. As a consequence of the premium price, organic produce is susceptible to fraud. Fair competition between producers and sustained consumer confidence favour organic production, and it requires regular confirmatory assessments of the identity of organic produce in addition to administrative controls.

Traditional analytical strategies for guaranteeing quality and uncovering adulteration have relied on the determination of the amount of a marker compound or compounds in a material and a subsequent comparison of the value(s) obtained with those established for equivalent material. Authentication of organic produce is complex, and depends very much on the product examined. Therefore, it is unlikely to find a single marker that allows discrimination between organic and conventional produce in general. Even for a particular product, this approach is challenging. Selective fingerprinting, which involves analysis of a range of compounds which are considered potential discriminators, is the more promising approach. As these techniques result in a high number of variables the application of multivariate statistical methods greatly facilitate the evaluation of the data. In the presentation an overview on targeted single/multiple marker approaches will be provided, e.g. based on isotope ratio analysis, in addition to information on the fingerprint type of methodology. The various techniques will be illustrated with real-life examples for both food and feed.

Key words: Authentication, feed, food, fraud, organic

TOPIC: Impact of Organic Feed on Animals

Charlotte LAURIDSEN

	<p>Current position: Senior Scientist Dept. of Animal Health and Bioscience Faculty of Agricultural Sciences (DJF) Aarhus University Research Centre Foulum Tjele Denmark</p>
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BIOGRAPHY

Present employment: Senior Scientist, Dept. of Animal Health and Bioscience, Faculty of Agricultural Sciences (DJF), Aarhus University, Research Centre Foulum, P.O. Box 50, 8830 Tjele, Denmark. Phone: + 45 89 99 12 38, fax: + 45 89 99 11 66, e-mail: Charlotte.Lauridsen@agrsci.dk

Education: MSc (Animal Nutrition), The Royal Veterinary and Agricultural University (RVAU), Frederiksberg, Denmark (1994), PhD (Food Chemistry), RVAU (1998)

Research training abroad: 2007-2008: Division of Veterinary Pathology, Infection and Immunity, School of Clinical Veterinary Science, Bristol University, UK, 7 months. Immunohistochemistry.

1999: Linus Pauling Institute, Oregon State University, Oregon, USA, 8 months. Bioavailability of stereochemical forms of vitamin E using LC/MS/MS.

Experience with management and coordination throughout career, e.g.:

- WP-leader in DARCOF-II (2000-2004) and DARCOF-III (2007-2010) projects.
- WP-leader in Core-organic (2007-2010).
- Main leader of an ongoing research project (2007-2010) funded by the Danish Research Council.
- Participant in an institutional group on Organic platforms.
- Main leader of several projects in collaboration with the industry (since 2001)

Editorial Boards and referee: Livestock Science (Section editor). Referee for several international journals within animal science, nutrition, physiology, immunology, and reproduction. Member of the board of the Pig Commission of the European Association for Animal Production (2010-). Member of the international societies "Lipidforum" and "Euro Fed Lipid".

Supervision and teaching: Currently main supervisor of 2 Phd-students, and several years of experience with supervision of BSc- and MSc-students. Teaching at the MSc-course "Lipidbiotechnology" at AU (2009-).

Research profile:

- Pig nutrition and production
- Nutritional immunology
- Animal models for humans (pigs and rats)
- Basic and applied lipid nutrition
- Vitamins (major focus on vitamin A, D, E, and C) and antioxidants
- Fatty acids (major focus on n-6 and n-3), eicosanoids and inflammatory markers
- Organic food and quality

For more information, please visit my home page:

http://agrsci.au.dk/institutter/institut_for_husdyrbiologi_og_sundhed/medarbejdere/cla

List of publications:

In total 55 scientific publications with peer-review (16/8-2010) and in total 152 scientific publications (international and national proceedings, theses, book chapters etc.).

ABSTRACT

EFFECT OF ORGANIC DIET ON BIOMARKERS OF HEALTH AND WELL-BEING IN RAT MODELS (L19)

C. Lauridsen^{1*}, U. Halekoh², M. Jacobsen¹, H. Jørgensen¹

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Most studies reported in the literature on organic versus conventional production systems and health impact suffer from the fact that only one replication per food produce was used, whereby the variation due to other sources could not be estimated. The overall objective of the present studies was to study the effects of foods - based on well-defined and well-controlled food produce systems - on health and well-being after long-term consumption using the rat as a model.

The crops used in Exp. 1 were obtained from a 2-year field trial study at three different locations (Foulum, Jyndevad and Flakkebjerg) in Denmark using two replications (plots). The crops (barley, faba beans, potatoes, wheat and rape seed) were grown in the long-term CropSys crop rotation experiment (<http://www.cropsys.elr.dk/uk/>) using three different agricultural systems: one conventional (C) and two organic growth systems (OA, organic using animal manure, and OB, organic using cover crops). Diets of each cultivation system were prepared at Research Centre Foulum, freeze-dried and kept frozen until use.

Carrots for experiment 2 were grown in the VegQure crop rotation experiment (<http://www.vegquire.elr.dk/uk/>) located at Aarslev. The cultivation systems and harvest years were similar as described above, and three replications (plots) were used. Carrots of each cultivation system were freeze-dried, and carrot-diets were prepared containing 40% carrot and 60% altromin (laboratory rat chow).

Experimental rats were obtained from Taconic a/s (Lille Skensved, Denmark) at weaning, and were fed the diets throughout the experiments. A control group of rats was included in both experiments, which was fed 100% of the altromin. Several biomarkers of health were assessed *in vivo* (growth, physical activity, bioavailability, clinical data), and *post mortem* (clinical evaluation, blood and tissue sampling for several indicators of nutritional status, immunity, and antioxidant activity).

Subsets of variables relating to fat, plasma or liver measurements of Exp. 1 were analyzed in a multivariate statistical model, and by visually graphical inspection (discriminant component analysis plot), it was possible to differentiate the three cultivation systems. However, only harvest year had a significant impact. Preliminary results showed that the concentration of immunoglobulin G in plasma of rats was influenced cultivation system. Regarding Exp. 2, harvest year rather than cultivation system influenced the used biomarkers in rats fed carrots, and where dietary difference was obtained, this was ascribed to difference between carrot diets and Altromin rather than cultivation system. In conclusion, several growing factors than just cultivation affect healthiness of vegetable products.

Key words: organic food, conventional food, immunity, carrots.

Acknowledgement: The work of experiment 1 was financially supported by the Ministry of Food, Agriculture, and Fisheries, Denmark, and coordinated by the International Centre for Research in Organic Food Systems (ICROFS) via the OrgTrace project (<http://www.orgtrace.elr.dk/uk/>). The work of experiment 2 was financially supported via the EU FP6 ERA-net CORE Organic program through the QACCP-project (<http://www.coreorganic.org/research/#Anchor-QACC-25881>).

TOPIC: Quality Changes for Organic Food Production Chain in Africa, Asia and Latin America

Michael-Bernhardt KRAWINKEL



Current position:
Professor of human nutrition
Justus-Liebig-university of Giessen
Germany

BIOGRAPHY

Michael-Bernhardt Krawinkel is professor of human nutrition with focus on nutrition in developing countries at the Justus-Liebig-university in Giessen, Germany; pediatrician; teaching also international nutrition at the university of Vienna and the Hebrew University of Jerusalem in Rehovot, Israel; research on dietary diversity for meeting the micronutrient needs of populations and on bioactive substances in bitter gourd, chronic diseases in Africa, and fruit and vegetable consumption in European school children.

ABSTRACT

OVERCOMING UNDER NUTRITION WITH LOCAL RESOURCES IN AFRICA, ASIA AND LATIN AMERICA (LW6)

Michael B. Krawinkel

Local resources for food security are widely underestimated in areas where development has cut the chains of traditional knowledge and skills of the population. Therefore, often research is needed in order to identify and examine the neglected food plants and animals. This is especially true for fruits and vegetables but also relevant for e.g. the consumption of millet, quinoa and other forgotten or neglected staple foods.

Making use of natural resources also provides an excellent opportunity to increase the diversity of diets thereby achieving the supply of nutrients within their biological structures. Besides increasing the availability of nutrients and food energy fruits and vegetables are also sources of valuable bioactive substances, e.g. phytosterols, resveratrol, momordicine, exerting preventive and curative health effects.

This approach to overcoming hunger does not just mean to increase actual food availability – often measured in terms of food energy only - but to include foods into the diets which contribute to health immediately and on longer terms. Also, identifying food sources which are not considered yet can help to secure nutrition and food. Research in this field requires a well planned interaction between researchers and local populations. Food security can be achieved with sustainable use of natural resources in most circumstances.

TOPIC: Dairy Products – Quality and Health Implications

Charlotte BRAUN-FAHRLÄNDER

	<p>Current position: Professor, Research group leader Swiss Tropical and Public Health Institute University of Basel Switzerland</p>
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BIOGRAPHY

Professional Training and Position:

Medical School at the University of Basel und Heidelberg, *Federal Exam for Physicians* (1975), MD 1984.

Postgraduate Training in Epidemiology and Medical Statistics at the London School of Hygiene and Tropical Medicine (University of London), *Diploma in 'Epidemiology and Medical Statistics'* (1988 - 1989)

Medical specialisation in Prevention and Public Health (1990)

Personal Research Grant of the Swiss National Science Foundation in the area of Social- and Preventive Medicine (**PROSPER**- Grant, NF Nr. 3233-030252 and NF Nr. 3233-030252), 1991-1997.

Position:

Head of the Department of Environment and Health at the Institute of Social and Preventive Medicine, University of Basel (1996)

Member of the Directorate of the Institute of Social and Preventive Medicine, University of Basel (1996)

Habilitation at the Medical Faculty, University of Basel (1998).

Associate Professor at the Medical Faculty of the University of Basel (2002)

Director of the PhD program of the Swiss School of Public Health (SSPH+) (since 2007)

Deputy Director of the Institute of Social and Preventive Medicine between 2005 and 2009

Current position: Research group leader at the newly created (2010) Swiss Tropical and Public Health Institute

Prizes:

Pulmedica-Prize 2002 of the Society for Lung and Airway Research

Glaxo-Smith-Kline award for best paper published in 2002 by a member of the Assembly "Epidemiology and Occupation" of the ERS

Teaching:

Medical Faculty of the University of Basel (Bachelor and Master Level) teaching responsibilities in the area of Epidemiology and Public Health

Master of Public Health program of the Universities of Basel, Zürich and Bern: Courses in Environmental Epidemiology and Health Interventions

Lectures in Environmental Health in several Interdisciplinary Programs at the University of Basel and Bern

Master Thesis Supervision at the Faculty of Medicine (Public Health, Sports Science) of the University of Basel and in the postgraduate MPH Program

Supervision of PhD thesis at the Faculty of Science of the University of Basel (Epidemiology and Public Health)

Research Projects:

Principal investigator of research projects in the area of environmental epidemiology with a focus on air pollution and health in children, on environmental influences on asthma and allergy in children and on environmental determinants of physical activity in children

She has published widely (more than 70 scientific peer-reviewed papers in last 5 years).

ABSTRACT

CAN FARM MILK PROTECT FROM THE DEVELOPMENT OF ASTHMA AND ALLERGIES? (LW7)

Charlotte Braun-Fahrländer

Cow's milk is an important part of human diet and a source of food allergy for some individuals. Medical guidance strongly discourages consumption of raw milk because of the known health risk associated with pathogenic bacteria present in unpasteurized milk. Despite these risks there is a growing body of epidemiological evidence suggesting that consumption of unprocessed cow's milk does not increase but rather decreases the risk of asthma, hay fever and atopic sensitization.

The presentation reviews the epidemiological literature and discusses components of unprocessed milk potentially responsible for this protection. Although the epidemiological evidence consistently suggest a protective role of unprocessed cow's milk consumption on the development of asthma, hay fever and atopic sensitization the underlying mechanisms are not yet understood and the consumption of raw milk cannot be recommended as a preventive measure for allergic diseases.

TOPIC: Impact of Organic Food on Humans

Chris SEAL



Current position:
Professor of Food & Human Nutrition
Newcastle University
UK

BIOGRAPHY

Chris Seal is Professor of Food & Human Nutrition at Newcastle University. He leads the Food Quality and Health research group in the School of Agriculture, Food & Rural Development and is Co-Director of the University's Human Nutrition Research Centre. He is Degree Programme Director for the Food & Human Nutrition BSc degrees in Newcastle University and Singapore. His research interests include how to encourage dietary change and to evaluate the effectiveness of changing diet. A particular focus is promoting the adoption of healthy diets based on increased consumption of wholegrain foods, fruits and vegetables. Chris has coordinated a number of intervention studies with volunteers to test the health benefits of eating these foods. Prof Seal works closely with colleagues from the Nafferton Ecological Farming Group investigating the effects of organic, low input and conventional production systems on the nutritional value of foods. His work is supported by the Food Standards Agency, Research Councils and industry. Prof Seal sits on many national and international research advisory committees and is a member of 'The Breakfast Panel' to promote breakfasts as part of a healthy lifestyle.

EXTERNAL ACTIVITIES:

Learned Society

- Honorary Scientific Development Officer, The Nutrition Society 2006 – 2009; Honorary Programmes Secretary, The Nutrition Society, 1998 – 2004, and Council Member, 1994 – 2004;
- Member of Council of the Federation of European Nutrition Societies (FENS), 2007.

Other External Activities

- Supplements Editor, British Journal of Nutrition;
- External Assessor, South African National Research Foundation;
- Member of International Life Sciences Institute (ILSI) Europe Expert groups on mitigation of acrylamide in foods and effects of food processing on food quality;

RESEARCH FUNDING and ACTIVITIES:

Wide range of research programmes coordinated as Principal Investigator or as a co-applicant. Funding sources include Sheepdrove Trust, Commission of the European Community, Food Standards Agency, BBSRC, DEFRA and Industry. Many of these projects involve human intervention studies to investigate the impact of changing diet on cardiovascular health.

Key research areas include:

- Metabolic consequences of food consumption in health and disease;
- Attitudes and beliefs in relation to food choice in health and disease;
- Health benefits of wholegrain foods, including antioxidant status;
- Health benefits of fruit and vegetable consumption;
- Impact of food production and processing systems on food quality and consumer preference;
- Studies with human volunteers including acute metabolic studies, surveys and interventions.

ABSTRACT

IMPLICATIONS FOR HEALTH OF DIFFERENCES IN FATTY ACID COMPOSITION OF ORGANIC VERSUS CONVENTIONAL MILK (L22)


Chris Seal^{1,2}, Gillian Butler^{1,3}, Socrates Stergiadis,^{2,3} and Carlo Leifert^{2,3}

¹Human Nutrition Research Centre, ²School of Agriculture, Food & Rural Development, Newcastle University, Newcastle upon Tyne NE1 7RU, UK and ³Nafferton Ecological Farming Group, Newcastle University, Stocksfield, Northumberland, NE43 7XD.

Differences in animal management systems have a major impact on all aspects of animal production including product yield, product sensory characteristics and nutrient composition; the consequence of changing management systems, therefore, has impacts throughout the food chain from the primary producer to the consumer. We have completed a number of studies investigating the impact of organic managements systems on milk fatty acid composition, including the relative proportions of saturated, monounsaturated and polyunsaturated fatty acids in milk. In addition we have focussed on the analysis of the conjugated linoleic acids of the C18 series (conjugated linoleic acids or CLA) which are of particular interest because of their reported effects on a number of lifestyle diseases such as obesity, cancer and hypertension. We showed significant seasonal effects on milk fatty acid content with higher concentrations of polyunsaturated fatty acids and CLA isomers in organic compared with conventional milks and higher concentrations in summer compared with winter sampling periods. These differences were not only seen in milk at the farm level but also in supermarket milk, clearly demonstrating that changing management systems will affect the composition of products entering the human diet. The relevance of these differences in the context of human health, however, has not been investigated in intervention trials and such experiments are clearly required. In the meantime, predictions of the benefits of consuming organic dairy foods can be made using knowledge of concentrations of fatty acids in [dairy] foods and their habitual intake in the human diet. Dairy foods are the principal source of CLA in the diet, and so it is possible to calculate differences in CLA intake based on changing dairy foods from conventional management systems with those produced under organic conditions. These empirical calculations can then be used to predict possible health benefits in comparison with studies where fatty acid intake has been artificially manipulated. The results of such calculations and the potential magnitude of beneficial effects will be discussed in this presentation.

TOPIC: Organic Related Health Concepts

Fred WIEGANT

 A portrait photograph of Fred Wiegant, a man with a grey beard and glasses, wearing a dark sweater over a white collared shirt.	<p>Current position: Fellow 'Life Sciences' Associate professor in the Department of biology, Institute of Education University College Utrecht Netherlands</p>
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BIOGRAPHY

Dr Fred Wiegant is Fellow 'Life Sciences' at University College Utrecht, the honours college of Utrecht University as well as associate professor in the department of biology, Institute of Education. Currently, he is teaching introductory courses in the field of Molecular Cell Biology, Evolution and Physiology at UCU. In his research he has focused on the concept of self-recovery at the cellular & organism level and on strategies used to stimulate the mechanisms underlying self-recovery. In this respect, he has studied the similia-principle (the basis of homeopathy) at the molecular and cellular level, and the mechanism of action of adaptogens (plant extracts). Adaptogens are extracts of specific plants that are known to enhance stress resistance and to delay aging processes. As one of the effects, a stimulation of anti-oxidative mechanisms has been demonstrated in response to a mild pro-oxidative (hormetic) stress action of the plant extracts in *C.elegans* as well as in cell cultures.

ABSTRACT

CONCEPTS OF HEALTH, RELATING TO ORGANIC FOOD (L26)

FAC Wiegant, MH Bakker, W Dijk, HAB Prins and MAS Huber

The health benefits of consuming organically produced foods compared to conventional foods are unclear. Important obstacles to draw clear conclusions in this field of research are: 1) the lack of a clear operational definition of 'health', 2) the inability to distinguish between different stages of healthiness using valid biomarkers and 3) difficulties in identifying an overall integrative physiological explanation of effects induced by the consumption of organically produced food in comparison with those induced by consumption of conventional food.

In this paper, some shortcomings of the current definition of health are outlined. In particular, it is explained how implementing a dynamic component into the definition of health, which is reflected by the ability to adapt, is of particular importance.

The state of health could then be determined by challenging an individual with some form of stress and subsequently by evaluating and qualifying the coherence in recovery of various physiological processes and parameters. A set of relevant parameters include the activity of the immune system and the activity of the autonomous nervous system (ECG, EEG, GSR). A well-coordinated pattern of recovery towards homeostasis is suggested to reflect a qualitatively good state of 'health'. Adding a dynamic component to the current concept of health would allow for classification of various levels of 'health' within individuals, who are all considered to be healthy. Furthermore, it would enable objective evaluation of preventive strategies, including the consumption of organically related foods that aim to strengthen health.

To further analyze the mechanisms that facilitate and maintain a general state of health, the concepts of 'homeostasis' and 'allostasis' are addressed. Also, a number of concepts that are related to these underlying mechanisms are outlined. These include 'the ability to adapt', 'resilience', and 'robustness'. Finally, the concept of 'hormesis' is addressed as a possible explanation in which a variety of physiological mechanism are triggered leading to beneficial health-related effects of organic foods as compared to conventional foods.