

International conference

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The first international conference on organic food quality and health research

It was the largest gathering of its kind to date, with people attending from 30 different countries including the US, the Baltic States, Africa and New Zealand. Thirty seven oral presentations and 75 poster presentations addressed issues of organic food quality, how it can be measured, what influences quality and whether the quality of organic food does really contribute to the health of consumers - animal or human.

Organic food research

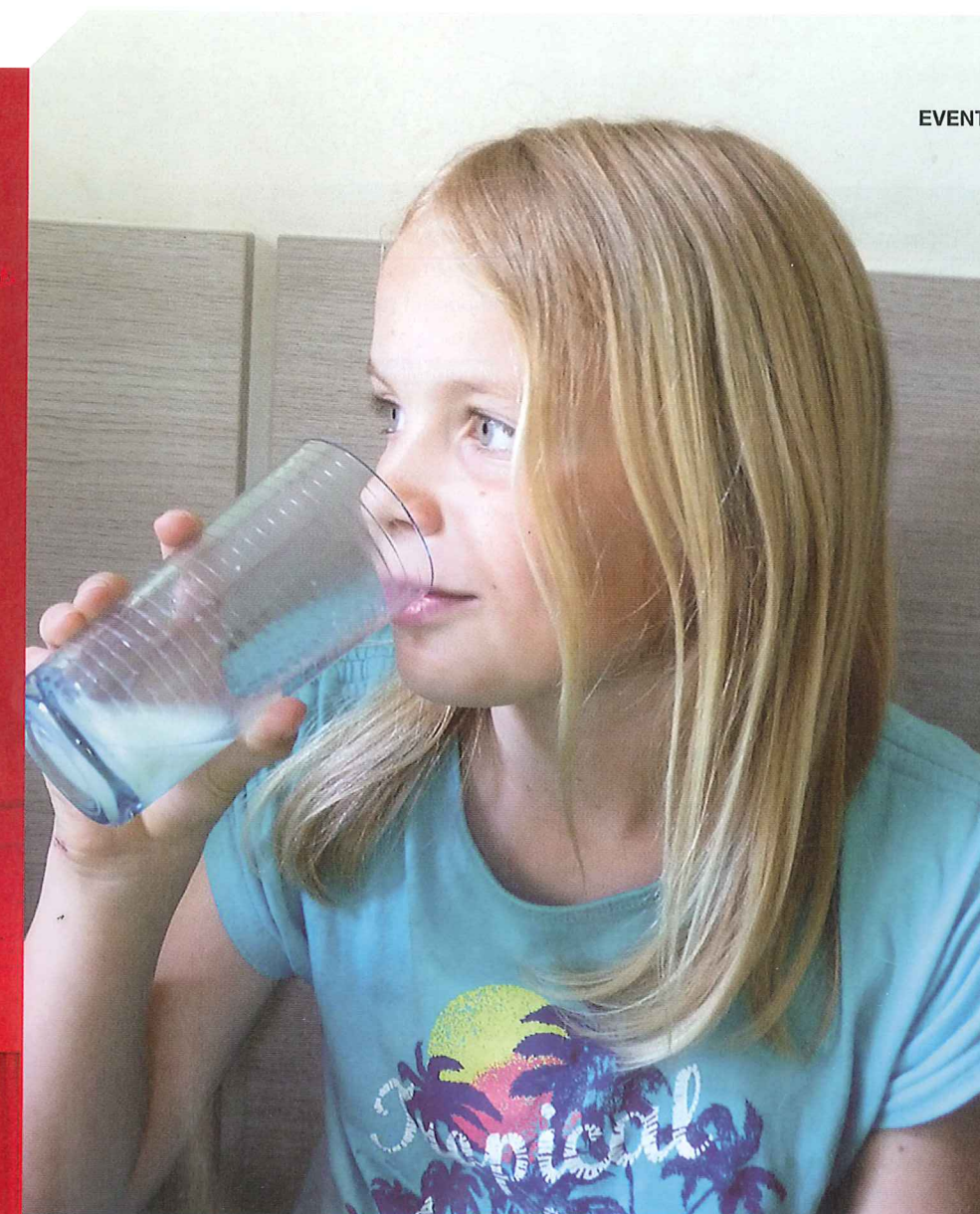
Johannes Kahl, chair of the Organic Food Quality and Health Association (FQH), an association of research institutes, was pleasantly surprised by the interest in the conference and the high quality of the abstracts (200 in total) submitted. The welcoming speeches of the organisers,

FQH, Technology Platform Organics (TPO) and the Institute of Chemical Technology (ICT) in Prague highlighted the growing maturity of research into organic food quality and health. Since the founding of FQH in 2003, the association has provided a forum for scientists, stimulating discussion, collaborations and improving the quality of scientific research. This is now developing into a coherent joint research agenda, particularly because of TPO's role in formulating a vision, strategic research agenda and implementation plan for organic agricultural and food research that is being presented to the EU.

The first presentations discussed organic agriculture's role in providing ecosystem services, setting the context of 'farm to fork'. Barbara Burlingame set out the

FAO's view on a sustainable diet. FAO's focus is undergoing quite a drastic change and now recognizes the importance of biodiversity in ensuring long term food security. A shift in focus is occurring away from intensive agriculture and towards sustainable food production. "Wild species increase food security and form a source of important nutrients. A reduction of indigenous food species in people's diets reduces their health status and increases the prevalence of obesity", Burlingame said. The loss of varieties has a dramatic effect on nutritional status: (in Bangladesh the number of varieties of rice has declined from 5000 to just 23). Urs Niggli (FiBL) continued the discussion by summarizing the ecosystem services of organic agriculture. The pursuit of food security

In mid May the first international conference on organic food quality and health research took place in Prague, the Czech Republic. It was a unique event where over 160 scientists and others gathered to discuss the latest research on organic food quality and health.



through conventional means has led to problems in ecosystem services, including increased soil erosion and a loss of biodiversity. Organic agriculture may provide an answer to these problems. According to Niggli, if half the world's soils were cultivated organically this would "postpone the heating of the world by 2-3 years, so it is not a solution to the problem. The main advantage is that the soil will be more resistant and the resilience of the whole system will be improved, so the consequences will be less dramatic".

Potential health effects

David Jacobs (University of Minnesota) discussed how to assess the potential health effects of organic food. He emphasized that we should keep in mind that we eat food, not nutrients. "Food is a mixture

of constituents with an evolutionary background. Its effect on health is synergetic and extraordinarily complex". Because of this complexity the randomized intervention study (seen as the most objective and optimal design study) is unlikely to be successful when studying food, because it is practically not possible to 'blind' food, to find a good 'placebo-diet' and to maintain a given diet for long enough to do a long term study. In practice therefore observational studies, which track people for years, are the best way to study the effects of diets. Statistical techniques can be used to adjust for other lifestyle factors. (KOALA, a Dutch cohort study, is one such example).

On the second day several aspects of organic food quality were discussed.

There was a discussion about the differences in nutritional quality and safety of organic food compared to conventional foods and about the influence of processing. Gillian Butler (Newcastle University) reported on the beneficial effect of outdoor grazing on levels of the unsaturated fatty acid CLA (which also vary with coun-



Johannes Kahl

try and seasonal differences). Giovanni Dinelli (University of Bologna) discussed the use of traditional wheat varieties within organic agriculture as a way to improve the nutraceutical content of the diet. Alongside the benefits, potential risks were also discussed. Anette Jensen (Technical University of Denmark) presented the results of experiments in which slurry contaminated with E-Coli was used. While E-coli were detected in the crop and in the soil, further analyses indicated that the fecal contamination of the crops was not primarily due to the slurry but originated from alternative sources, such as contaminated water and wildlife. The impact of processing on product quality was discussed by Ursula Kretschmar (FIBL). She pointed out that sensory quality is a key-issue within the processing chain and that processors do not always accord health the same priority that consumers do. Kathrin Seidell (FIBL) presented the results of the Core-QACCP study, which investigated the influence of processing on the quality of baby food. It showed that the use of frozen as opposed to fresh or stored carrots had a major impact on the quality of baby food,

leading to a loss of carotenoids, taste and structure. Sterilization played a less important role in the final quality.

Methodology

An important theme of this conference was looking at the tools and methods available to assess quality. Several presentations were devoted to this subject. The results showed a remarkable mixture of sophisticated modern techniques and more classical methods that are both now used within organic research. Some analytical techniques are not only used to measure quality but are also used to differentiate between organic and non-organic products in order to prevent fraud. The techniques discussed included:

- the biocrystallization method (Nicolaas Busscher, University of Kassel);
- a fluorescence based sensor, Naturalys, to assess the difference between fresh,



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pasteurized and stored products (Inez Birlouez, Biocitech);

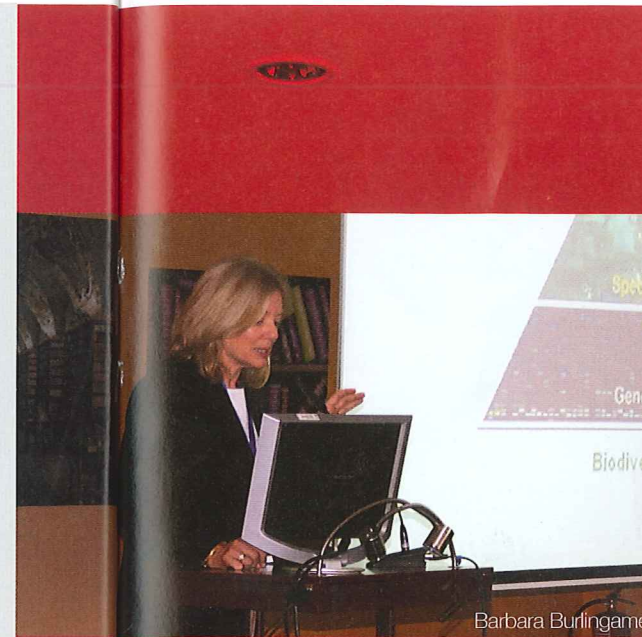
- Ambient mass spectrometry, realized by DART (Direct Analyses in Real Time) for differentiating between organic and conventional apples, potato tubers and tomatoes (Jana Hajslova, ICT, Prague);
- Profiling techniques to differentiate between organic and conventional eggs, which use carotenoid levels as the main indicator. Here the differences may be due to the feed used or to differences in the hens, as organic systems often use different strains of chicken (Saskia van Ruth, RIKILT);

- Fingerprinting results from the Org-Trace study done in Denmark. This can show the difference in levels of anthocyanides, minerals, different isotopes of N and other components. It was stressed that because of the complexity of plants multi-element fingerprinting should always be performed (Søren Husted, University of Copenhagen).

During the conference, 4 workshops were organized covering the following themes: organic food quality concepts; quality changes for organic food production chains in Africa, Asia and Latin America; consumer-related aspects of quality and; dairy products – quality and health issues.

The consumer related aspects discussed trust (Virgilijus Skulskis, Lithuanian Institute of Agrarian Economics), taste (Tim Obermowe, University of Göttingen) and perceived health benefits (Lucy van de Vijver, Louis Bolk Institute), all important aspects of organic consumption. A lively discussion emerged on how to increase consumer trust which, in Lithuania, is an important aspect in getting people to buy organic. The study of perceived health benefits showed the positive health experiences consumers had with organic food and raised a discussion about the value of this type of study.

The workshop on dairy products paid special attention to the use of raw milk. The benefits of raw milk for consumers' health were discussed by Charlotte Braun-Fahrlander (University of Basel) who presented results from the Parsifal and Gabriela study, showing that raw milk is associated with decreased risks of asthma and allergies. Gerhard Jahreis (University of Jena) associated raw milk with preventing inflammatory and cardiovascular diseases. Ton Baars (University of Kassel) presented the results of a study in children with an



Barbara Burlingame

suspected allergy to milk, who reacted adversely to conventional milk, but were able to tolerate raw (biodynamic) milk. Alongside these benefits there are also risks associated with raw milk: it can contain harmful bacteria such as EHEC E-coli bacteria, listeria and campylobacter. Wolfgang Kneifel (University of Natural Resources and Life Science, Vienna) argued the case for developing new processing techniques that maintain the benefits of raw milk while reducing the potential for these bacteria occurring.

On the last day the question of health was discussed. Intervention studies performed in rats (Charlotte Lauridsen, Aarhus University), mice (Elena Mengheri, Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione, Rome) and an observational study in pigs (Albert Sundrum, University of Kassel) did not reveal any unequivocal beneficial effects of an organic diet. The health effects on humans are often derived from the higher levels of specific nutrients, e.g. the higher levels of CLA fatty acids in milk are associated with a decreased risk in cardiovascular disease and eczema (Chris Seal, Newcastle University). The results of a few studies among humans were discussed; including one on the absorption of minerals (Susanne Bügel, University of Copenhagen) and on protection against DNA damage (Karlis Briviba, Max-Rubner Institute). Neither of these showed any major differences between organic and conventional diets. The only study that directly looked at the

sensitivity to allergens was lower in the organic group. Organic eating, however, is very closely related to the anthroposophic lifestyle, which makes it difficult to draw a clear conclusion.

The final session discussed the problems encountered when doing research into organic food and health. While health should not be defined solely in terms of the presence, or absence, of illness, we do lack a clear definition of health which can be applied in practice and which offers an overall and integrative physiological explanation for the variety of effects observed in an organism. Fred Wiegant (Utrecht University) discussed the terms homeostasis and allostasis in this context. These include the ability to adapt, and the resilience and robustness of an individual. Machteld Huber (Louis Bolk Institute) discussed the potential for operationalizing these concepts in research on organic food and health. She discussed the results of her study "Is organic more healthy?" which showed clear differences between organically and conventionally fed chickens, although this did not allow any conclusions to be drawn about which animals were more healthy. There is scope for further developing this line of work.

While the conference did not have any sensational or surprising results, the overall feeling was positive. It brought together a large group of researchers from all over the world. During the breaks they met, made contacts with each other and discussed existing projects and future opportunities. The conference created not only new contacts but also new inspiration to those who attended. ■

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More information on the presentations can be found in the book of abstracts, which can be downloaded from the following link <http://www.fqh2011.org/book-abstracts.html> or from FQH's website <http://www.organicfqrresearch.org/>.

A reduction of indigenous food species in people's diets reduces their health status and increases the prevalence of obesity.

health effects of a diet was the Swedish ALADDIN study, carried out among anthroposophic families. The results showed that at the age of 6 months the prevalence of