FINNISH ORGANIC
RESEARCH INSTITUTE

SCIENTIFIC SEMINAR ON ORGANIC FOOD 2014

– open, critical and collaborative approaches

5-7 November 2014, Mikkeli, Finland

BOOK OF ABSTRACTS

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2014

Publisher Finnish Organic Research Institute
Lönnrotinkatu 7
50100 FI-MIKKELI

www.luomuinstituutti.fi

Cover Photo Ismo Funke

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WELCOMING WORDS

DEAR GUESTS, SPEAKERS AND PARTICIPANTS

I have a great pleasure to welcome you all to the Scientific Seminar on Organic Food 2014 organized by Finnish Organic Research Institute FORI. The seminar is second in order, the first seminar under the same title was held in 2012. Soon after that University of Helsinki and MTT Agrifood Research Finland made the decision to found Finnish Organic Research Institute, FORI, and it started from the beginning of year 2013. The coordination unit of FORI is located in Mikkeli University Campus in Mikkeli city center.

The seminar will be multidisciplinary and focus on the whole food chain. Multidisciplinarity is one of the main principles of FORI: we need different disciplines to answer the questions we have to solve in order to make the food production more sustainable for people, nature and society. Also the Research Programme for Organic Food and Farming in Finland, published 2014, follows the principle of multidisciplinarity and collaboration.

The seminar takes place in Kyyhkylä manor by Lake Saimaa. The surroundings of Kyyhkylä have a long and rich history. Already in the Stone Age the area was inhabited. Especially well known Kyyhkylä and Tuukkala areas are of the very rich archeological relics from the Iron Age.

I also welcome you all to enjoy the organic and local food the region of Mikkeli and Southern Savo. The region is one of the leading counties in this field in Finland.

The seminar offers you multidisciplinary, open, critical and collaborative approaches to the questions of the organic food chain. I hope you will be satisfied with the content.

Enjoy your stay in Kyyhkylä and Mikkeli region!

Pirjo Siiskonen
Professor
Director of Finnish Organic Research Institute

SEMINAR PRESENTATIONS

HIGHER ANTIOXIDANT CONCENTRATIONS AND LESS CADMIUM AND PESTICIDE RESIDUES IN ORGANICALLY-GROWN CROPS

RAIJA TAHVONEN, MTT AGRIFOOD RESEARCH FINLAND

This presentation is based on the article published in British Journal of Nutrition, July 15th 2014 (Baranski, M. et al. Br J Nutr 112:794-811). An international team of experts led by Newcastle University (UK) analysed 343 peer-reviewed publications comparing conventional and organic crops and foods. The study was funded jointly by the European Framework 6 programme and the Sheepdrove Trust, and it is the result of a groundbreaking new systematic literature review and meta-analysis. Research on the area has been vivid during the recent years and brought significant amounts of new data. Main results:

1. Concentrations of antioxidants such as polyphenolics were between 18-69% higher in organically-grown crops.
2. Concentrations of toxic heavy metals, for instance cadmium, were 48 % lower on the average
3. Concentrations of total nitrogen were 10%, nitrate 30% and nitrite 87% lower in organic compared to conventional crops
4. Pesticide residues were four times more likely to be found in conventional crops than organic ones In addition, differences were found in several nutrients and phytochemicals.

Detailed figures and tables are available in Supplementary Materials (89 pages). The database generated and used for this analysis is freely available on the Newcastle University website (http://research.ncl.ac.uk/nefg/QOF). What the results means in practice: This study has shown clear compositional differences between organic and conventional products. A switch to eating organic fruit, vegetable and cereals and food made from them would provide additional antioxidants equivalent to eating between 1-2 extra portions of fruit and vegetables a day. High intake of antioxidant nutrients and phytochemicals seems to protect against many life-style diseases. Lower intake of toxic metals might also be beneficial for health. The present cadmium intake is close to the tolerable intake levels in several countries. Interestingly, high intakes of antioxidant nutrients and phytochemicals may mitigate harmful effects of cadmium. Lower nitrogen contents and pesticide occurrence might also be beneficial for health. However, to prove the health effects, we need well-controlled human dietary intervention and cohort studies specifically designed to identify and quantify the health impacts of switching to organic food. For these studies we need new biomarkers, and we need also studies continuing through several generations.

ORGANIC FOODS: QUALITY, CONSUMPTION PATTERNS OF FRENCH ADULTS AND HEALTH INDEXES

DENIS LAIRON[1] AND EMMANUELLE KESSE-GUYOT[2]

Consuming eco-friendly foods is increasingly popular while organic product qualities are still debated and profiles of organic food consumers have rarely been described.

We will first briefly review present scientific knowledge showing that organic products generally contain more dry matter, some minerals (Mg; Fe, Zn), vitamin C and anti-oxidants (phenolics), and omega-3 polyunsaturated fatty acids, but are less contaminated by cadmium and only marginally by pesticide residues.

We will then report on the profile of organic food consumers in France. Consumer attitude and frequency of use of 18 organic products were assessed in 54,311 adult participants in the French Nutrinet-Santé cohort. Cluster analysis was performed to identify behaviors and socio-demographic characteristics, food consumption and nutrient intake were determined. Cross-sectional association with overweight/obesity was estimated using logistic regression. Five clusters were identified: 3 clusters of non-consumers whose reasons differed, occasional (OCOP, 51%) and regular (RCOP, 14%) organic product consumers. RCOP were more highly educated and physically active than others. They also exhibited dietary patterns that included more plant foods and less sweet and alcoholic beverages, processed meat or milk. Their nutrient intake profiles (fatty acids, most minerals and vitamins, fibers) were healthier and more closely adhered to dietary guidelines. In multivariate models (after accounting for confounders), compared to those not interested in organic products, RCOP participants showed a markedly lower probability of overweight (excluding obesity) ($25 \leq BMI < 30$) and obesity ($BMI \geq 30$): -36% and -62% in men and -42% and -48% in women, respectively ($P < 0.0001$). OCOP participants generally showed intermediate figures. (Original article published in 2013 in PlosOne, 8(10): e76998. doi:10.1371/journal.pone.0076998).

In conclusion, foods produced under organic farming practices generally have a better nutritional and toxicological value and regular consumers of organic products exhibit an overall plant-based and healthy profile better fitting sustainable diet concepts.

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ENTOMOPATHOGENIC FUNGI AND NATURAL COMPOUNDS TO CONTROL HONEY BEE PARASITES IN HONEY PRODUCTION

ERNESTO GUZMAN, UNIVERSITY OF GUELPH, CANADA

Bees' honey is considered a natural, healthy product, for human consumption. As such, it should not contain chemical residues of medicines used to control honey bee (Apis mellifera) parasites and other pathogens. Therefore, to produce honey in a safe way, alternative treatments to synthetic chemicals are needed for the control of pathogens in hives. In our lab, we have tested entomopathogenic fungi including Metarhizium anisopliae, Beauveria bassiana and Clonostachys rosea, as well as essential oils to control Varroa destructor mites. V. destructor has become the most serious health problem of honey bees worldwide. Fungi and essential oils were assessed for their efficacy to kill varroa mites and for their toxicity to bees. At 7 days post inoculation (dpi), the three fungi caused significant varroa mortality compared to non-inoculated mites. In bee brood treated only with varroa mites, expression of honey bee immune and health related genes decreased over time, whereas fungal infection of the brood resulted in increased expression of these genes. Therefore, entomopathogenic fungi could reduce varroa mite damage to honey bee brood by both infecting the parasite and preventing varroa-associated suppression of honey bee immunity. Essential oils caused > 85% mite mortality. Both, fungal isolates and essential oils showed relative toxicity to the bees. The potential use and limitations of these alternative treatments against the parasitic mite V. destructor in honey production will be discussed.

ANALYTICAL AUTHENTICATION OF ORGANIC FOODS

F. C. SIMEONE AND S.M. VAN RUTH,
WAGENINGEN UNIVERSITY AND RESEARCH CENTRE

A growing consumers' awareness of human health's risks, environmental fragility, and animal welfare has boosted organic production of foods. Due to their high production costs, however, organic products tend to retail at higher prices than their non-organic counterparts. This premium price exposes organic products to fraud and counterfeiting, which, in addition to administrative controls, call for confirmatory assessments of the organic identity.

Authentication of organic products is a complex task, which requires the identification, quantification, and distribution analysis of multiple compounds which are considered discriminators (i.e., fingerprints) between organic and non-organic products. Unlike conventional analytical methods, in fact, identifying, in foods, a single marker of authenticity would be, if even possible, useless.

Selective fingerprinting uses state-of-the-art mass spectrometry, and a variety of spectroscopies to determine multiple chemical fingerprints in the organic product; in addition, these techniques produce large numbers of data which enable a statistical verification (for example,by multivariate statistical protocols) of the authenticity of the product.

The talk gives an overview of fingerprinting approaches and their application to the authentication of real-life foods, such as eggs, meat, tomatoes, cereals, fruits, and coffee.

ORGANIC FOOD AND CONSUMERS' EXPANDING NOTION OF HEALTH

MINNA MIKKOLA, FINNISH ORGANIC RESEARCH INSTITUTE, UNIVERSITY OF HELSINKI

In the current Western culture benevolence, freedom and equity regarding all humans on the face of the earth represent the central moral aspirations distinctive for our way of living. This does not mean that these aspirations would be met as they are often left rather inarticulate; their 'real' relational and operational meaning can be 'shallow' for those who propose them. In terms of food, this becomes evident when walking through supermarket aisles; how much inequity, injustice and environmental damage may be included in the production histories of the food items on display? As health cannot represent just a narrow bodily notion but must be understood to expand into environmental, social and moral dimensions, entailing in principal a 'world view in action', it may also be seen to signify a developmental path into increasing coherence on the level of personal life. One way to orientate towards deeper and more coherent understanding of these 'hypergoods' of the Western culture is to construct a narrative of the meaning of one's food consumption and respective production as they connect with the ones of others and the environment. This paper sets out to outline first the expanding notion of health in terms of increasing coherence of Western values in food production and consumption and second, to analyze 'seeds of change' through a range of case studies exemplifying such developments. Here different ways to organize the relations and operations of (organic and biodynamic) food production and consumption become variously intertwined with everyday lives of citizens. While the retail sector seems to dominate food consumption by offering the only and convenient access to food, a number of initiatives to the more meaningful but laborious operations entailing a particular world view seem to abound. These developments towards increased coherence as an expanding notion of health may influence on the available options for our ways of producing and consuming food in more articulate ways in terms of sustainability.

DOMESTIC ANIMALS AND INFECTIOUS DISEASES IN ORGANIC FARMING – THE NEED FOR ALTERNATIVES TO CONTROL (RESISTANT) PATHOGENS

MICHAEL WALKENHORST, RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FIBL), DEPARTMENT OF LIVESTOCK SCIENCE, FRICK, SWITZERLAND

DOMESTIC ANIMALS

Per worldwide human being about 15 "livestock beings" (more than two thirds of them are poultry individuals but also 0.3 small ruminants, 0.2 cattle and 0.15 pigs; FAO, 2013) are living on our planet. The estimated live weight of human and domestic animals rises through the last 10-15'000 years from 0.1% to 98% of the total world live weight of all land living vertebrates (Brown, L. R. 2006) so "we and our livestock" are the vertebrate component of the world ecosystem. Regarding the security of food supply an urgent need to reduce the animal protein in human nutrition exists but, on the other hand, about 2/3 of the total world agricultural land is permanent grassland, only to utilize with livestock, mainly ruminants. Keeping livestock healthy and productive (without a rising risk for human health or the natural environment) will be one of the challenges of the next decades.

INFECTIOUS DISEASES

Infections and infectious diseases -including parasites- might be as old as vertebrates, but compared to other organisms vertebrates developed an efficient system to react – the immune system. The origin of antibiotic resistance, for example, is most probably older than vertebrates themselves. The mode of action of several antibiotics is based on products of microorganism's metabolism to compete with the microorganism's society (Lang et al., 2011; Allen et al., 2009; Waksman and Woodruff, 1940). But this "chemical" resistance is not the only defense mechanism of microorganisms. The biofilm as an extracellular-polymeric-matrix-protected association of different microorganism species seems to be comparably effective and protects additionally against the immune system (Wei and Ma, 2014).

So resistances or other defense mechanisms of pathogens are tremendously older than the first therapeutically use of antibiotics or antiparasitics but the high prevalence, density and worldwide flow of livestock - living under permanent latent performance stress (and therefore immune-depressed) in a system where the use of (mostly orally applicated) antibiotics and antiparasitics seems to be a production factor - are optimal living and expansion conditions for specialized and resistant patho- and a-pathogens (Gutkind et al., 2013; Garcia-Alvarez et al., 2012; Kaplan and Vidyashankar, 2012).

ORGANIC LIVESTOCK

Exact data regarding the world's organic livestock population are still lacking. In Europe about 3% of the ruminants and less than 1% of pigs and poultry are living under organic conditions (Eurostat, 2010). Representative data regarding the prevalence of infectious diseases and the use of antibiotics are lacking for organic as well as for non-organic livestock in large parts of Europe, but might be in organic livestock lower than in non-organic systems (Hovi et al., 2003; Ivemeyer et al., 2012).

The European regulations on organic agriculture (Anonymus 2012) demand a specific cascade to reach a high health status in organic livestock population and minimize the use of "chemical synthetic drugs and antibiotics": (1) breeding robust animals as long term, (2) species-specific feeding, housing and management including preventive herd health management as medium term and (3) complementary medicine (for instance phytotherapy) as short term approach. Chemical synthetic drugs and antibiotics shall be used only

in cases of emergency. Are these demands worthwhile from a scientific point of view?

PREVENTIVE HERD HEALTH MANAGEMENT

Different research activities of the last decade show the significance of preventive management measures, exemplarily (a) the potential of preventive herd health management both in reducing antibiotic input (Ivemeyer et al., 2008 and 2012) and in improving health parameters in organic dairy farms (Ivemeyer et al., 2012) or (b) the effect of paddock management on worm burden of organic laying hens (Maurer et al. 2013).

PHYTOTHERAPY

Phytotherapy - based on a broad spectrum of secondary plant metabolites and their plant species specific combination - hold a large and widely unemployed potential to treat diseased animals or to improve the overall animal health situation. For example different studies consolidate the positive effect of the tannin rich sainfoin (Onobrychis viciifolia Scop) in parasite controll in sheep (Werne et al. 2013a and b). A wide spectrum of european medicinal plants is still used traditionally to treat different kinds of infectious diseases in livestock (Schmid et al. 2012, Disler et al. 2014).

Compared to antibiotics or antiparasitics (which are in most cases monosubstances) the extracts from medicinal plants are multi componant compositions and have therefore only a low risk to rise resistances. Several plant extracts affect biofilms (Wojnicz et al., 2012) or even activate the immune system (Schapowal A., 2013). A lot of pharmaceutical, pharmacological and human clinical research is available (Escop, 2003; Meier et al. 2014) but it is still missing in the field of animal health care and veterinary medicine (Walkenhorst et al. 2014). There is an urgent need for high quality clinical research on this issue.

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INTERNATIONAL SOCIETY OF ORGANIC FARMING RESEARCH ISOFAR: NETWORK THE GLOBAL ORGANIC RESEARCH

PROF. DR. **GEROLD RAHMANN**, BOARD OF ISOFAR

In 2003, ISOFAR was funded to network the isolated global organic researchers. Only academic persons are member, not institutions. In 2013, there were about 1109 active and passive members, coming from 97 countries all over the world.

The main work is to inform members about organic farming research with newsletters and conferences (e.g., the scientific tracks at the Organic World Congress), giving organic research a forum through a scientific Journal of Organic Farming.

The challenges for the future are, to make more and more researchers active in organic research, to merge activities and informations and last but not least, to help to solve the future challenges: food demand of an increasing global population, climate change, healthy environment, ending fosil fuel and changing public expectations and actions.

ISOFAR has to change his strategy as a pur scientific communication network into a society to merge efforts and resources to have better arguments for the contribution of organic farming to solve future challenges through

a) Regular global assessment of ongoing organic research in the countries: Who is doing what, and what are the results?: networking actions and results.
b) Design of regional and global strategic research action plans, together with IFOAM and local actors: giving visions to solve future problems.
c) Support and joining communication of Organic Farming in international and national committees with scientific based information: becoming a voice for organic farming.
d) More members and communication between the members.

Despite the problems of shortage of resources for organic research all over the world, increasing challenges to stay communication and decisions with non-organic food systems, still too much isolated researchers, no or few research results, how organic farming can help to solve future problems, we should not give up but to do better: for the future of a healthy and secure humanity under the shelter of the four principles of Organic Farming: fair, ecology, health and care.

We need you – becoming member, becoming active!

GLOBAL FOOD CRISIS AND FUTURE SCENARIOS ON ORGANIC FOOD CONSUMPTION

HELENA KAHILUOTO, MTT AGRIFOOD RESEARCH FINLAND

Currently, one eighth of the population is chronically undernourished, and malnutrition is even more common. This prints long-lasting traces in the capacity of people to solve problems and build our common future. The multiple global inequities such as climate inequity and inequities in access to resources such as to nutrients, aggravate the situation and prevent building the global social capital urgently needed to solve global problems. The more so, because the upper tolerable limits of the planet are reported to be transgressed regarding several anthropogenic changes. Biodiversity loss, climate change and flows of reactive nutrients belong to them. We need to return to within the planetary boundaries in a situation where the global population is higher than ever and is still rapidly growing. This will require a higher scarcity in the overall use of resources and thus makes a more equal distribution even more important. Organic farming is one strategy to sustainable development of food and farming. It offers approved solutions relying on local resources especially for situations with highest food insecurity and least access to external inputs. The organic sector can continue to contribute to the sustainable development of the global food system by taking further steps on its way for example by strengthening the viewpoint of social equity. In the presentation the challenges are quantified and contrasting scenarios for the sustainable food system presented.

WORKSHOPS

CEREALS WITH SHORTER STRAW ARE BETTER, ALSO IN ORGANIC FARMING

KAIJA HAKALA AND PIRJO PELTONEN-SAINIO, MTT AGRIFOOD RESEARCH FINLAND

Introduction of dwarfing genes that help to produce higher yields with less above-ground biomass (higher harvest index and thus lower inputs to residue at the expense of food) have together with chemical fertilization, pest control, increased irrigation and other technological developments been main components of the green revolution after the 1940s. While the new genotypes with shorter straw have been found superior in good conditions and with chemical fertilizers, there have been questions about how the modern varieties would cope in less than optimal conditions, such as drought, or in organic farming where nutrients may be less easily accessible. These questions are based on the assumption that short cereal varieties and genotypes with dwarfing genes would have smaller root systems and lower water and nutrient extraction capacity (MacKey 1988). The worries about poor performance of short stature cereals have mostly been in vain, as most studies, already from the beginning of the 1970s, show that shorter straw improves the water extraction and nutrient harvesting capacity of cereals, in both good and poor conditions. However, there are limits to how short the straw can be: dwarf genotypes with two dwarfing alleles are inferior to both tall and semi-dwarf genotypes (Butler et al. 2005). Special case is, however, organic farming. In a recent study (Gooding et al. 2012) it was found that the best straw height for winter wheat in conventional farming is about 80 cm, while the best straw height for organic farming is 15 cm taller, or about 96 cm. This was not because of differences in the root system, but because the taller genotypes compete better with weeds.

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GREENHOUSE GAS EMISSIONS OF ORGANIC DAIRY FARMS FROM SIX EUROPEAN COUNTRIES

SANNA HIETALA[1], LAURENCE SMITH[2], MARIE T. KNUDSEN[3], SIRPA KURPPA[4], SUSANNE PADEL[2] AND JOHN E. HERMANSEN[4]

Of all anthropogenic greenhouse gas (GHG) emissions 18 % is estimated to originate in agriculture and the largest agricultural contributor to these emissions is the cattle farming (FAO 2006). According to Gerber et al. (2013) global cattle farming contributes an annual total of 4.6 Gt of CO2 equivalents, dairy farmings' contribution to this being 2.1 Gt of CO2 equivalents a year based on Life Cycle Assessment (LCA) approach.

Here, based on data from six European countries, the GHG emissions of a total of 34 organic dairy farms are presented based on LCA approach (as in Hietala et al. 2014). The farm data was collected from a wide variety of farms: 8 from the United Kingdom, 8 from Denmark, 7 from Finland, 2 from Belgium, 4 from Italy and 5 from Austria were assessed. The farm size varied from 9 to 480 dairy cows and from annual production volumes of 41 to 4267 tonnes of Energy Corrected Milk (ECM) per farm and annual milk yield per cow from 2032 to 8717 kg ECM.

LCA was carried out using system boundaries from cradle to farm gate. GHG emissions were calculated using the LCA method described by Schmidt & Dalgaard (2012a, b). Functional unit used was 1 kg of ECM.

The total GHG emissions of organic dairy farming in Europe averaged 1.33 kg CO2 equivalents per kg of ECM milk, with a standard deviation of 0.22, whereas the averages per country were 1.52 ± 0.33 (AT), 1.17 ± 0.23 (BE), 1.28 ± 0.18 (DK), 1.34 ± 0.19 (FI), 1.31 ± 0.23 (IT) and 1.33 ± 0.17 (UK) kg CO2 equivalents per kg of ECM milk.

Of the total average GHG emissions, starting from largest contributor, enteric fermentation by dairy cows contributes and from raising cattle contributes 45 %. N2O emissions from housing and crop cultivation account for 22%, farm capital goods account for 9 % and manure management is 6% of the total emissions. Electricity and fuels are both contributing 5 %, purchased manure and live animals 4 % and imported feeds contribute 3 % of total GHG emissions. Taken together, the above factors contribute 99 % of all GHG emissions, remaining 1% resulting from transport and manure treatment. Of these, the main contributor is enteric fermentation, which accounts for nearly half of all GHG emissions in total.

Here, variations in GHG emissions between dairy producing farms and between countries are seen. The results are consistent with recent studies from the perspective of the overall carbon footprint, although methodological differences make a direct comparison difficult. Variations in the tactical management of farms can be viewed as leading to variances in emissions (Henriksson et al. 2011).

In mitigation of GHG emissions from organic dairy sector, especially feed quality and the nutrient efficiency play a large role. Feed digestibility could be improved, even if it is already considered high in Western Europe (Gerber et al. 2013). Calculation of methane emissions from enteric fermentation depend on gross energy intake. Therefore GHG emissions from enteric fermentation of farms with less energy intake compared to milk yield are lower. In mitigating N2O emissions, large impact is in manure/fertilizer and land use efficiency.

Current calculation does not yet take account of carbon sequestration. Adding this would benefit the farms using permanent pastures that are more grass-based. Adding carbon sequestration to these calculations would provide a more complete picture of GHG emissions from organic dairy farms.

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PROSPECTS OF DEVELOPMENT OF ORGANIC PRODUCTION IN RUSSIA

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The production of organic food products in the Russian Federation is in beginning of the way. Officially, the term "organic" products appeared in Russia in 2008 with the introduction of Chapter 6 "Sanitary requirements for organic products" in SanPin 2.3.2.1078-01 "Hygienic requirements for safety and nutritional value of food products." This year, the Russian Ministry of Agriculture plans to submit to the State Duma a bill "On the production of organic products", which took a broad public discussion. Without waiting for the law, some Russian farmers have practicing organic method of production. Number of NGOs actively working in this direction (Russian Anthroposophical Society, St. Petersburg Ecological Union, Russian Association of Organic Farming, and others). The corresponding Western organizations are involved in the certification of organic production. However, this year St. Petersburg Ecological Union has developed and offers a voluntary certification system for organic production. According to experts of the Russian Association of Organic Farming, this year the market for organic products will exceed $ 150 billion Rubles in Russia. If this year adequate regulations of organic agriculture will be taken on and appropriate technology and methodology will be widely available for farmers, it is already for 5 years, Russia will be able to fully meet population with organic products. North-West Research Institute began to deal actively with issues of scientific support for organic production in recent years. The methodology of organic production is being developed for the North-West region of Russia. In 2014, together with Agrarian University the field experiment with potatoes was founded and conducted, to evaluate the effectiveness of different types of organic fertilizers. The project to build an innovative territorial organic cluster within Luga municipal district of the Leningrad region is prepared. The program design institute is responsible for working out methods and technologies of organic crop production, the development of design solutions to build of organic farms for livestock. Together with representatives of other institutions the technologies: to carry out organic cattle and food production from organic raw materials will be prepared. Local farmers will be trained; links with processing industries and trade will be established. Expected to conduct explanatory work with residents, they will be informed about the benefits of the consumption of organic products. Finnish colleagues gave us significant assistance in the development of organic agriculture. In the frame of the project SE 717, the tour through Finnish organic farms and was organized for Russian farmers and students and scientists. Ruralia Institute has trained Russian representatives in organic issues late 2013 - early 2014. Thus, the program of action for the development of organic farming in the North-West region of Russia formed and will be carried out. To the success of its implementation better coordination all stakeholders is required.

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RISK IGNORANCE AND IT ORIENTED VET TO IMPROVE ORGANIC-GREEN AGRICULTURAL SYSTEM

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Bangladesh is one of the densely populated countries in the world with abundant fertile land and water resources. The agriculture sector in Bangladesh provides livelihoods to more than two-thirds of the population, contributing 23% of the total national Gross Domestic Product (GDP). However, there are huge challenges for agricultural water availability uses due to severe impacts of climate change on water resource and depletion of groundwater are potential threats to agricultural activities and local farm workers health and livelihoods and can cause environmental hazards. Moreover, large number (about 71%) of the population living in rural areas (mostly farmers) are still lagging behind with lack of necessary capacities including short of adequate knowledge of understanding (or ignorance) in both environmental and health risks, which are contributing to excess use of pesticide, fertilizers and agrochemicals for agricultural production, mixing or adding of prohibited or hazardous chemicals (e.g. Calcium Carbide, Sodium Cyclamate, Cyanide and Formalin, DDT etc.) to foods and foodstuffs for food adulteration, post-harvest preservation, processing or use those chemicals as preservatives to keep fresh without sufficiently aware of health and environmental consequences. It is alarming that only 4% of farmers formally trained in pesticide use or handling fertilizers, and over 87% openly admitting to using little or no protective measures while applying pesticides. As a result, more than 65% of the total agricultural area is suffering from declining soil fertility, and about 85% of net cultivable area has organic matter below the minimum requirement. Furthermore, risk of natural events such as drought, floods are also understood by local producers as Divine Retribution or Natural matters instead of the impacts of climate change by high numbers of local people in rural areas in Bangladesh. All of these are contributing to increase environmental, ecological risks and as well as posing threats to human health and livelihoods although of different initiatives are in place by public (agricultural extension) and private sectors (such as NGOs). Thus, the key risks due to ignorance or lack of producers capacity of risks mitigation: "Overuse and inappropriate use of agrochemicals, overuse and imbalanced use of irrigation, inorganic fertilizers and pesticides have led to contamination of water, loss of genetic diversity and deterioration of soil quality. " Increasing evidence of human health problems associated with agricultural production, consumption of agrochemicals, including pesticides and adding of prohibited or hazardous chemicals to foods and foodstuffs for food adulteration, post-harvest preservation, processing is also emerging as toxic elements have entered into the food chain; " Increased risks of implementation of climate change adaptation strategies by ignoring (based on Divine retribution concept) the linkages of the impacts of climate change to the risks of natural events such as drought, floods. Thus, the main objectives of this paper are to highlight: 1) linkages between agricultural extensions policies of agricultural related risks and implementation strategies; 2) linkages of understanding risks and risks ignorance and 3) how participatory design and IT oriented agriculture-based vocational education can facilitates developing Organic-Green agricultural systems in Bangladesh.

UROLITHINS SHOW BOTH ANTIOXIDANT AND PRO-OXIDANT ACTIVITIES DEPENDING ON ASSAY

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Urolithins are microbial metabolites of plant-derived polyphenols, ellagitannins1. They are absorbed in the intestine whereas ellagitannins and their hydrolysis product ellagic acid are not. Ellagitannins and ellagic acid are strong antioxidants, but there are contradictory reports on antioxidative properties of urolithins (1-3). This study investigated redox properties of urolithins A and B using ORAC assay, three cell-based assays, copper-initiated pro-oxidant activity (CIPA) assay, and cyclic voltammetry. Urolithins were strong antioxidants in the ORAC assay measuring antioxidant activity mediated by the hydrogen atom transfer mechanism, but mostly pro-oxidants in cell-based assays, although urolithin A was an antioxidant in cell culture medium. Parent compound ellagic acid was a strong extracellular antioxidant, but showed no response in the intracellular assay. The CIPA assay confirmed the pro-oxidant activity of ellagitannin metabolites. In the cell proliferation assay, urolithins but not ellagic acid decreased growth and metabolism of HepG2 liver cells. In cyclic voltammetry, the oxidation of urolithin A was partly reversible, but that of urolithin B was irreversible. These results illustrate how strongly measured redox properties depend on the employed assay system and conditions and emphasize the importance of studying pro-oxidant and antioxidant activities in parallel.

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ANTIBACTERIAL ACTIVITY OF ORGANIC HONEY AGAINST FOOD PATHOGENIC *CLOSTRIDIUM PERFRINGENS*

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In this study the antimicrobial activity and methylglyoxal (MGO) contents of five Finnish multifloral organic honeys and one organic multifloral honey originated from Argentina and Hungary were investigated against *Clostridium perfringens*. *C. perfringens* is one of the most common causes of food poisonings and is known to cause human and animal diseases. Honeys were tested at the concentration of 50% (w/v). For the antimicrobial assessment a disc diffusion method was used and zone of inhibition was expressed as a diameter. Four of the studied honeys showed inhibitory activity (diameter >8 mm) compared to control sugar solution (diameter of 6.1 ± 1.5) against *C. perfringens*. All the honeys showing antimicrobial activity were of Finnish origin. The broadest zone of inhibition was induced by North Carelien multifloral organic honey with willow herb as the main floral source (referred here as F) (diameter of 14,3 mm ± 0.6), followed by other North Carelien multifloral organic honey (diameter of 11 mm ± 2) with clover as the main floral source (referred here as E). The minimum inhibitory concentration (MIC) was determined for honey F, being 20% (w/v). Methylglyoxal (MGO) quantification in honey samples was carried out using HPLC method. In the studied honeys MGO concentration varied from 22 to 27 mg/kg and it did not correlate on antimicrobial activity of the honeys. To our knowledge this is the first report on the antibacterial activity of organic honeys and antimicrobial activity of honey against *C. perfringens*.

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THE FINNISH ORGANIC FOOD CHAIN - AN ACTIVITY THEORY APPROACH

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The Finnish Government has set several goals for the development of the organic food system in Finland (MMM 2013). None of the previous goals have been reached. Decision-making regarding the quality of the food chain and its products is not based on consumersvalues and needs. It is based only on quantitative facts such as profitability (Kuosmanen, Niemi 2009). In this article, the principles of co-creation theory (Gylden 2012) are integrated into the activity theory frame (Engeström 1987) in the Finnish food chain concept in order to identify the weak points of the food chain and to present a solution for reaching the goals set for the development of the organic food chain in Finland.

Material and methods: The activity theory forms a triangle, in which the actors and actions of the Finnish food chain might appear as follows: Subject: the companies and operators separately with no co-operation, Tools: doing business to reach the object, and Object: earning money. There are also other factors: Rules: everyones own rules, Community: no food-chain level co-operation, Division of labour: unfair competition, increased price margins and Outcome of the activity: does not lead to the development of the organic food chain. Some other factors were implemented in this model: The link between the food chain and the consumers is weak; the evaluation of the quality of the food chain process and food is based only on the quantitative aspects, not on consumers needs and the governments interaction with the rules of the food chain is weak. The main idea of co-creation theory is to get the customers (consumers) involved in the creation and development of products and services as co-creators. That will ensure that the products are accepted by the user. Safety, ecology, health and ethicality have been found to be the most important factors for the use of organic products (De Lorenzo et al. 2010).

Results: If the consumers values and opinions are introduced into the activity of the food chain, the evaluation criteria for the activity and business results (object) would also be qualitative such as safety, ecology, health and ethicality. That would force the food chain operators into mutual target setting and improved co-operation (subject, rules and community). The governments improved interaction to the widening price margins would reduce unfair competition. Discussion By listening to the consumers needs and values and taking those among the criteria for evaluating the quality of the food production process and food will the organic food chain develop to meet better the goals set for its production and consumption. The governments interaction with the food system is needed in the form of more effective taxation, subsidy policies and legislation.

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SIGNALING STATUS THROUGH FAVORING ORGANIC FOODS

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At the first glance, one might think that sustainable consumption choices and status signaling are incompatible with each other. Recent research, however, has shown that there may be important links between them. To illustrate, in the experimental study of Griskevicius, Tybur and Van den Bergh (2010), after the study participants were primed with status motives, they preferred less luxurious green products over more luxurious nongreen products through wide range of product categories (cars, backpacks, batteries etc.). Priming status motives increased the desire for green products especially when shopping in public (but not private) and when the green products were more (but not less) expensive than the nongreen products. But why do consumers want to communicate about their status by favoring sustainable products, brands and services? It has been suggested (Maynard 2007) that a person acting like this signals to others that he or she is a prosocial, rather than a proself, individual (in this paper, prosociality and status signaling are linked together with organic foods). Having a prosocial reputation can be extremely useful; people construed as cooperative and helpful are perceived as more desirable friends, allies, leaders and romantic partners. Thus, signaling about one's prosocial behavior may also be a viable strategy for attaining status. Drawing from the costly signaling theory (Zahavi 1975), it was hypothesized, that those consumers who signal about their habit of favoring organic foods 1) will be perceived as more respected (i.e. possess higher status), altruistic and affluent and that 2) they will be treated more favorably in social interactions than their non-signaling counterparts. To test the hypotheses, a total of 336 shoppers were approached in a mall. Those approached were asked to form an impression of a person (s/he is making a green salad in an ordinary kitchen surroundings) wearing either organic-labeled (n=168) or non-labeled (n=168) white t-shirt. More specifically, they were asked to rate this person (a picture in the questionnaire) on a 7-point scale in terms of status, wealth, attractiveness, kindness, trustworthiness, and altruism. Furthermore, the participants were asked how much money they would give to this person, if s/he was collecting donations for the catastrophe work of the local Red Cross. This question served to measure how (un)favorably a consumer signaling about his/her habit of favoring organic foods is treated in social interactions. Indeed, the person who signals about his/her habit of favoring organic foods received higher status ratings and was perceived as more altruistic than the non-signaler. In terms of the perceived wealth, no differences were found. Regarding the amount of charity donations, it was found, that the signalers, indeed, received more of them (57,5 %); the average donations were 10,70 for the signalers and 7,90¬ for the non-signalers. This difference was statistically significant. Together these results indicate that signaling about ones tendency to favor organic foods is not only a way to attain status; it can also make others to behave more positively towards the signaler.

ORGANIC FOOD HEALTH PERCEPTION AND COMMUNICATION AT A CROSSROAD?

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It appears to be a common assumption that organic food is healthier. Research on consumer´s motivation to buy repeatedly has found that the health motive ranges highest (e.g. Aertsens et al., 2009; Wan-chen et al., 2013; Zanoli & Naspetti, 2002). A similar conviction is found expressed in how food retailers position and communicate organic food, but especially in media reports about organic. However, there is also a share of consumers with considerable doubts about the healthiness of organic, and every now and then media reports are critically reflecting on the common assumption, or some scientific reviews conclude there is far less evidence than expected by the public (e.g. Smith-Spangler, et al., 2012). Furthermore, functional food is a category with increasing market share that appeals to the same consumer motive (Lähteenmäki, 2013), and the European regulation on nutrition and health claims is restricting what can be communicated about the healthiness of food (Aschemann-Witzel, 2011).

On this background, it is analysed which are the key arguments for either an overlap of these categories, or a clear distinction, from the perspective of the consumer, and which are challenges and opportunities for organic food´s health communication in the future. It has been found that functional food´s health claims are perceived as more credible on categories regarded as healthful per se, and that functional foods making use of general rather than specific claims are more appealing to consumers (Siró et al., 2008). In support of this, it has been observed that organic consumers prefer to choose an organic product with a health claim over one without (Aschemann-Witzel et al., 2013). Consumers might perceive producer and retailer efforts to improve healthiness of products as one element of a joint corporate social responsibility (Lähteenmäki, 2013), and there are marketing appeals and consumer trends that show a close combination of health and sustainability as related issues (Aschemann-Witzel, in press). Other research, however, has found consumers perceive products communicated with functional health claims to be less favourable in terms of e.g. naturalness or even taste (Lähteenmäki et al., 2010), and functional food might be understood as food enriched and tampered with(Bech-Larsen & Grunert, 2003). Underlying these associations are consumers modern health worries related to unknown technologies that the consumer has no control over (Furnham, 2007). The underlying philosophy of functional food as compared to organic food has been regarded as incompatible (Kahl et al. 2012); and it can well be compared to different medicinal approaches: the first is a single nutrient approach to solving a deficiency similar to conventional western medicine, while the other is a holistic approach to health similar to complementary and alternative medicine supporting prevention. The fact that consumer´s perception is so far not sufficiently backed up by the same degree of scientific evidence (Hughner et al., 2007) is a challenge, especially with functional foods increasingly receiving the European Food Safety Authorities allowance to use health claims. There is a need for more broadly accepted scientific evidence on organic food health attributes, as well as a consistent strategy to communicate and support the alternative holistic understanding that the organic sector would like consumers to understand and apply when considering organic food purchase.

QUALITY DIFFERENTIATION, VOLUME AND ECONOMIC PERFORMANCE OF ORGANIC FOOD VALUE CHAINS: PRELIMINARY RESULTS FROM A CROSS COUNTRY ANALYSIS

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In the heavily competed food markets, the small and medium-sized local organic supply chains have inherent problems in moving from niche to volume, and the mainstream large-scale market chains have inherent problems in securing and advancing organic values. Basically the organic supply chains use two strategies: either the focus is on high value niche products or on increasing the production volume and risking thereby compromise the value aspect. The European HealthyGrowth project aims at supporting the development of organic value chains and at improving the SMEsposition in the markets. This is done by looking for the basic prerequisites to combine the diverging objectives, that of growth in volume and that of maintaining organic values, quality, integrity and the consumers trust, and thus securing healthy growth of organic supply chains. As an outcome of the research general as well as locally adapted recommendations for the development of organic markets are brought forward and new opportunities are provided for small-scale producers to act and compete on the market while ensuring a premium price for their added organic values. The research is based on case study approach. Case studies are carried out on a number of successful mid-scale organic food value chains in nine European countries. Modes of governance and handling of changes, business and management logics, trade-off between quality differentiation, volume and economic performance, communication and mediation of values long the supply chains are explored in each case. Further, a comparative cross-country analysis is carried out in order to obtain an understanding of the drivers for the development of organic markets and of the underlying mechanisms and principles for healthy growth. The presentation focuses on the various ways of combining quality differentiation, volume and economic performance. Preliminary results from the HealthyGrowth case studies are presented and the implications in view of the Finnish food markets are discussed. The status of organic sector varies greatly among the HealthyGrowth countries, and this is reflected also in the studied cases. The overall prerequisites for the success of the studied organic value chains are good co-operation and fair distribution of the benefits along the chain including the consumers, and sufficient domestic demand. Depending on the situation, different strategies have been chosen to secure the balance between quality differentiation, volume and economic performance. These include increasing the range of products, finding new outlets for products, combining food production with other activities, finding very specific products or customers and adjusting the focus in quality differentiation. In several cases, attention is paid to multiplicative growth, i.e. growth of networks rather than to growth of single units. Also protected spaces provided by the public actors have been exploited in creating possibilities for the enterprises to develop. Regarding internal organization of the value chain, social conventions with codified rules have been introduced to secure the interests of the producers.

SOLID PROJECT PROMOTES ORGANIC AND LOW INPUT DAIRYING IN EUROPE

KAISA KUOPPALA

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In the rapidly changing environment in which Europe's agri-food industries must prosper, new knowledge-based farming systems are required that are profitable at a farm level, produce competitive food products for the market place, are environmentally sustainable and energy efficient. In dealing with the challenges facing agriculture such as climate change and biodiversity loss, the multi-functional potential of agricultural systems is now as important as productivity for a sustainable future for European agriculture. The SOLID (Sustainable Organic and Low Input Dairying) project supports developments and innovations in organic and low input dairy systems to optimize competitiveness while maximising the potential of these systems to deliver environmental goods and biodiversity, and optimising economic, agronomic and nutritional advantages for the development of innovative and sustainable organic and low input dairy systems and supply chains. Both dairy cow and coat systems are encompassed. SOLID involves 13 research partners in UK, Denmark, Austria, Italy, Belgium, Finland, Greece, Spain and Romania. An essential part of the project are the SMEs which enable a participatory approach for both research and dissemination supported by innovative science (e.g. proteomics) to answer practical problems and develop methodologies and models. An active Stakeholder Platform gives valuable feedback to the researchers and provides their expertise to the use of the project. The work packages cover the whole milk chain featuring 1) Innovation through stakeholder engagement and participatory research, 2) Adapted breeds for productivity, quality, health and welfare, 3) Forages for productivity, quality, animal health and welfare, 4) Environmental assessment for improvements and communication in organic and low input dairy systems, 5) Competitiveness of organic and low input dairy sector: Supply chain and consumer analysis, 6) Socio-economic evaluation of novel strategies in organic and low-input dairy farming, and 7) Knowledge exchange and training. SOLID will deliver an innovative toolbox of novel methodologies that will contribute to the competitiveness of the dairy industry and increase the effectiveness with which these benefits are delivered. MTT Agrifood Research Finland participates in all work packages and results from environmental assessment as well as future challenges of the organic milk supply chain in Europe are presented separately in the current seminar (Hietala et al., Latvala et al.). The project started in 2011, lasts until 2016 and is funded by the EC FP7 under the grant agreement n° 266367. For more information, see the project website at www.solidairy.eu. Among others, the website contains descriptions of farms around Europe that are involved in the project, and links to publications based on project results.

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IDENTIFYING FUTURE CHALLENGES OF THE ORGANIC MILK SUPPLY CHAIN IN EUROPE

TERHI LATVALA

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In the framework of the SOLID project an international Workshop was organized in Vantaa, Finland involving 11 European experts and stakeholders. The aim was to identify the opportunities and threats of the organic milk supply chain and to identify of optimal supply chain management strategies to improve competitiveness and adapt the production systems to geographical diversity. The Future Workshop methodology was employed, that includes four stages: critique, visioning, operationalization, and implementation. The critique and visioning steps helped in identifying clear points of improvement. In the operationalization and implementation phases, we brainstormed suggestions for improvement strategies that could be implemented to achieve this future state. Three groups of stakeholders were recruited, based on geographical origin: 1) Swedish and Finnish stakeholders, 2) Eastern and Southern European stakeholders from Romania, Estonia and Greece and 3) Italian and UK stakeholders. In the Future Workshop, each group of stakeholders was invited individually to describe 3-5 main challenges in the organic dairy supply chain in relation to competitiveness, innovation and sustainability. After a discussion of these challenges, including grouping related issues into broader categories, the group was asked to define an ideal situation where the challenge has been overcome. Groups were then asked to discuss, how far they think the sector is at present in solving the identified challenges, and how far the organic milk supply chain could go towards the ideal situation. Then groups discussed about those strategies that could solve the identified problems. The group also pondered whether the suggested three novel SOLID strategies (prolonged maternal feeding, protein feed and agroforestry), can contribute to answering the defined challenges. Finally, the groups voted for the strategies they saw as most important. At the end of the day, groups were asked to produce a written summary highlighting the key points from the discussions of the day from their point of view. The second day was made up of the presentation of these written summaries to the whole workshop, followed by an open discussion on the way forward for the sector. In total 34 challenges were identified by all the groups. Two main overlapping themes across EU geographical areas were farm profitability (six separate challenges identified) and EU or home-grown protein sources (totally three challenges identified, one in each group). As one of the solution to the profitability problems two groups identified that transparency (e.g. by using specific transparency indicators or by explaining more about the production process to the consumers) could be one solution. The Workshop produced rich variety of challenges and possible solutions, some of them involving a broad range of supply chain actors such as consumers, policy-makers and research. The importance of knowledge transfer from research to the farm was also highlighted.

FROM SCIENCE TO PRACTICE: BEST PRACTICE MODELS AS SOURCE OF INFORMATION AND IDEAS – A CASE STUDY AMONG RESEARCHERS AND STAKEHOLDERS

ANNE HYTÖNEN

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Science communication as universities societal actions and organic farming are growing sectors in EU. Practitioners need scientific research results in understandable language for developing their actions and source of livelihood. In LOVEt II -project the idea was to gather and evaluate the best practice models in knowledge transfer in organic farming sector.

15 project partners in 12 European countries conducted two surveys: 1) with selected scientists and 2) with selected stakeholders (N=7–12 in each survey). In questionnaire 1, the scientists were asked to describe best practices in knowledge transfer in their experience. In questionnaire 2, the stakeholders were asked to suggest proposals to improve the working methods for the future.

Both surveys were analysed both quantitatively and qualitatively. This study concentrates in qualitative analysis of the best practice models (Q1), and the free answers (Q2). With thematic reading and content analysis common factors and thematic groups were found. The best practice models (N=193) were classified in five thematic groups: 1) solving specific problems, 2) networking, 3) holistic/system approach, 4) multidisciplinary approach, and 5) knowledge sharing. Most of the best practices introduced seemed to arise from the existing practical problems, both country-related and shared commonly in EU-level. Several best practices in all categories emphasized the co-operation of different actors. Trust among actors was essential for success, and the meaning of the facilitator was important in creating new networks and opportunities for knowledge sharing. In addition, numerous best practices had elements from multiple categories.

In questionnaire 2, from the answers (N=92) the most of the suggestions dealt with supporting and developing communication activities (N=27). In addi-

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tion, co-operation with practitioners in research activities (N=25), and publishing best practices and research results from different countries (N=13) were frequently mentioned. It was also remarked, that research funding should include less self-financing of farmers (N=9).

The initiatives for developing communication included rewarding scientist for popularizing activities, using communication specialists and/or advisors in translating the knowledge from science to practice, and developing training, teaching and communication skills in general. In respondents´ opinion, more applied research is needed in addition to traditional scientific research. Participatory research should include the practitioners already in planning the activities.

In conclusion, the best practice models are important in learning and developing organic farming. Knowledge and examples from other countries can introduce new ideas and models for solving practice-related problems. In addition, new models for co-operation and networking are needed especially in new EU-countries.

The results show, that in organic farming sector there is willingness to share knowledge between different actors. However, academic language must be "translated" to understandable language for practitioners, and the help of facilitators, communication professionals and advisor services are needed in this work.

As in science communication literature, the change from knowledge transfer via knowledge sharing into knowledge co-creation can be seen. Instead of solving specific problems in isolation, networking and sharing knowledge and ideas help to develop organic farming in practice.

Key words: science communication, knowledge, organic farming, scientists, EU member states

LOCALLY PRODUCED ORGANIC FOOD IN THE SOUTHERN SAVO RESTAURANTS

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The aim of this study was to find out the amount of locally produced organic ingredients served in restaurants in the Southern Savonia region and whether the supply of locally produced organic vegetables and meat was sufficient.

The data was collected by a questionnaire sent to the restaurants of the region. Three persons responsible of the food preparation in their restaurants were interviewed for additional information. In this study the term restaurant was defined as an establishment where warm meals are being prepared. The restaurants were divided into six groups: hotel restaurants, lunch cafes, public catering units, dining restaurants, canteens and restaurants open for private occasions. A semi structured questionnaire was sent to 132 restaurants. The response rate was 23%. A theme interview was conducted in two restaurants, a dining restaurant Bistro Vilee in Mikkeli, and a public catering company Järvi-Saimaan palvelut, which is in charge of the food served at public canteens in the municipality of Juva.

Organically produced ingredients were used in 47 % of the restaurants and locally produced organic ingredients in 27 % of the restaurants. The locally produced organic ingredients were mainly vegetables. 38 % of the respondents found the supply of locally produced organic vegetables insufficient and 54 % of the respondents found the same situation with the locally produced organic meat. The main factor which affected to the purchase of organic foods was the price (88 %). Other significant factors were the supply of organic ingredients (44 %) and the quality of organic foods (36 %).

The results of the theme interviews pointed out the difference in needs of the small scale and large scale restaurants. According to the results there is need for 1) processed organically produced local ingredients which can be delivered in big quantities, 2) special varieties of vegetables and 3) high quality meat which can be delivered in small amounts to small scale restaurants and need for better logistics. There are not enough processing facilities for organically produced ingredients in Southern Savonia. The most urgent need is for dairy manufacturing organic products such as cheese and ice cream and a small scale slaughterhouse for the locally produced organic meat products. The producers and the restaurateurs do not communicate enough and therefore do not know each other's needs. Organized meetings would enable the development of the supply chain of local organically produced ingredients in Southern Savonia.

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ORGANIC NWFP AND THE NOVEL FOOD REGULATION

SUSANNA KESKINARKAUS, UNIVERSITY OF HELSINKI, RURALIA INSTITUTE

"Entrepreneurs are key actors in sustainable societies as they are the creators of employment and economic growth. Market demand for foods produced from northern plants is increasing as they are perceived as flavorful and pure. The forests in Lapland are an enormous area for sources of organic ingredients. However, entrepreneurs in the field of non-wood forest products (NWFP) face many challenges due to the complex EU-legislation regulating Novel Foods and health claims. Although these regulations were created to protect customers, they now act as a barrier to innovating new NWFP from mostly organic, domestic ingredients and being able to compete in the international market. We have in 2014 investigated the business environment of NWFP-entrepreneurs and found that "The EU Novel Food Regulation is a bureaucratic tool that in the case of natural and organic plants does not protect customers but does instead prohibit innovative entrepreneurship ". In addition to the challenges the domestic interpretation of the Novel Food Regulation poses on the entrepreneurs, the enterprises have great difficulty in getting information about the plants that the regulation applies to and finding officials who will help them with the process. The official communication of the organizations that oversee the implementation of the regulation make it clear that failure to comply with the regulation will be result in expensive fines and other commercial consequences resulting in a business environment dominated by fear rather than experimentation. This might lead to a situation where organic products are brought from abroad rather than produced domestically and domestic actors lose their competitiveness. "The fact that the Novel Food Regulation expects all individual enterprises to prove that the part of the plant they are planning to use has been used in foods before 1997 in exactly the same purpose is an unreasonable burden on SMEs. Most of the companies didn't even exist almost two decades ago and those companies that did, have not saved old receipts and sales documents. SMEs don't have the time and staff resources to hunt for proof of substantial use from other companies or even public sources. As a conclusion, the novel food status of domestic plants should be investigated either jointly or by a third party but in such a way that it would not prevent domestic enterprises from utilizing domestic NWFP. This directly affects organic production as well since the Novel Food regulation also limits the use of organic plants unless the company proves traditional use dating before 1997 in written documents which are extremely challenging to find since most of the use in Finland has been in domestic households."

SEMINAR PROGRAMME

ARRIVAL DAY: WEDNESDAY, NOVEMBER 5, 2014

Arrival at Hotel Cumulus or at Kyyhkylä Manor

14:45	Departure for an excursion and dinner from Kyyhkylä Manor by bus via Hotel Cumulus
15:00	Departure for an excursion and dinner from Hotel Cumulus by bus
15:00–18:30	Excursion to local dairy farm MuuMaa and dinner at Tertti Manor (Duration of an excursion is appr. 4 hours)
18.30	Departure from Tertti Manor back to Hotel Cumulus and Kyyhkylä Manor
19:00	Return to Hotel Cumulus and Kyyhkylä Manor

DAY 1: THURSDAY, NOVEMBER 6, 2014

Seminar venue: Kyyhkylä Manor, Rustholli building

08:15	Transportation from Hotel Cumulus to Kyyhkylä Manor
08:30–9:00	Registration, coffee and refreshments
09:00–9:15	Opening speech: **Professor, Director Pirjo Siiskonen**, Finnish Organic Research Institute

Theme: Current trends of organic food research – Chair: Professor, Director Pirjo Siiskonen

09:15–10:00	**Professor, Docent Raija Tahvonen**, MTT Agrifood Research Finland: Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: a systematic literature review and meta-analyses
	Discussion
10:15–11:00	Emeritus Research Director at INSERM, **Doctor Denis Lairon**, INSERM/INRA, Marseille, France: Organic foods : quality, consumption patterns of French adults and health indexes
11:00–11.30	Discussion and refreshments

Theme: Quality and origin of organic food – Chair: Adjunct Professor Carina Tikkanen-Kaukanen

11:30–12:15	**Professor Ernesto Guzman**, University of Guelph, Canada: Entomopathogenic fungi and natural compounds as potential bio-control agents in honey production
	Discussion
12:30–13:15	Senior Scientist, **Doctor Felice Simeone**, Wageningen University and Research Centre, the Netherlands: Determination authenticity of organic food products
	Discussion

13:30–14:30 Lunch at Kyyhkylä Manor

Theme: Health Reputation of Organic Food – Chair: Principal Research Scientist Helena Kahiluoto

14:30–15:15	**Doctor Minna Mikkola**, Research Director of Social Sciences, Finnish Organic Research Institute: Organic food and consumers' expanding notion of health
	Discussion

15:30–16:30 **Poster Exhibition**

Discussion, coffee and refreshments

16:30–17:00 **Doctor Michael Walkenhorst**, FiBL, Switzerland: Domestic animals and infectious diseases in organic farming – the need for alternatives to antibiotics?

Discussion

17:15 Ending of the day
17:30 Transportation to Hotel Cumulus
19:30 Transportation from Hotel Cumulus to Kyyhkylä Manor for dinner
20:00–23:00 Dinner at Kyyhkylä Manor. Dinner speech: **Professor, Director Pirjo Siiskonen**, Finnish Organic Research Institute
23:00 Transportation to Hotel Cumulus

DAY 2: FRIDAY, NOVEMBER 7, 2014

Seminar venue: Kyyhkylä Manor, Rustholli building
08:30 Transportation from Hotel Cumulus to Kyyhkylä Manor

Theme: Organic Food and Society – Chair: Doctor Sinikka Mynttinen
9:00–10:30 **Workshops on the seminar themes**:
A. Organic primary production, environment and product quality
B. Organic products and society

10:30–11:00 Coffee and refreshments

11:00–11:30 **Professor, Dr. habil. Gerold Rahmann**, Director of the Thünen-Institute of Organic Farming, Germany, Board member of ISOFAR and TIPI (IFOAM):
The need of concerted research actions for organic farming in the world. The recent strategy plans of ISOFAR and IFOAM and what can we learn from national action/research plans

Discussion

11:45–12:15 **Senior Research Scientist Helena Kahiluoto**, MTT Agrifood Research Finland:
Global food crisis and future scenarios on organic food consumption

Discussion

12:30–12:45 Closing of the seminar
12:45–13:45 Lunch
13.45 Transportation from Kyyhkylä Manor to Mikkeli town center/railway/bus station

EXCURSION ATTRACTIONS

MUUMAA ORGANIC DAIRY FARM

Muumaa organic dairy a joint enterprise of three farmers with 120 milking cows, calves and heifers. The farm has got 400 hectares in cultivation. Muumaa is considered as a model farm in terms of organic farming and collaboration of farmers, thus attracting both Finnish and foreign visiting groups. Muumaa dairy farm is located in Juva municipal, South Savo, 30 km Mikkeli.

TERTTI MANOR

Tertti manor is a functioning farm, a heaven for gastronomies and a cosy manor hotel. The Manor Tertti has been known already from 15th century. The farm was called Hintsala rustholli. During the period of Great Hate a man and a horse were equipped for the Kings's army. The rustholli was named after its master Hannu Hintsa. Manor house has had a lot of owners, german and russian people. 1894 Aatami Pylkkänen bought a manor house and 900 hectares of land. The manor house has been in a same family already 120 years. The son Iivari started to renovate the estate. Buildings were renovated and the gardens designed. Tertti's rose was planted. A dairy school founded by Tertti's dairy in 1896 from where Aatami's son Iivari found his fiance. Edla and Iivari had seven children. The start of the Winter War changed many things. Five sons left for the front and the war took its toll. Two of the sons were killed in action at an interval of one month. During the war time Artillery Officer Svanström and Commissary General Officer Gustafsson were stationed at Tertti together with their staff. After the war Tertti was still a traditional farmhouse. Olavi Pylkkänen took over together with his wife Liisa. The farm's dairy cattle was excellent and sheep were also bred.

In 1978 the management of Tertti is passed to the hands of Pepita and Matti Pylkkänen. They decided to concentrate on tourism and specialized cultivation. The buildings have been renovated with respect to old traditions and the garden and immediate surroundings have been brought to the way they were at the end of the 19th century.The main building is today a restaurant. The old storehouses are the accommodation rooms. The shed and toilet has been renovated to sauna and conference rooms. In the stable we have a wedding dances, group meals etc. and in the summer time it's a shop. The owner's home used to be a place where the workers lived. Tertti's shop and coffee place is a only new building opened in 2007. It has been built the way the diary used to be in 19th century. Inside the walls of the cowbarn we have a beautiful garden with three different rooms.

USEFUL INFORMATION

SEMINAR INFO DESK

The seminar info desk is available during the whole seminar in Kyyhkylä Manor. In any questions, please do not hesitate to come to see us, or phone Elina, tel. +358 44 300 1271 or Heli, tel. +358 44 590 6834.

INTERNET CONNECTIONS

Kyyhkylä Manor has open wireless network connections for visitors. Password is not required.

SEMINAR WEBSITE

www.luomuinstituutti.fi/en/organic-food-2014/

SEMINAR VENUE KYYHKYLÄ MANOR WEBSITE

www.kyyhkyla.fi

OPENING HOURS OF LOCAL SERVICES

- Banks (for example Etelä-Savon Osuuspankki and Nordea) Mon-Fri 9.30-16.15, Sat-Sun closed
- Pharmacies Mon-Fri 8.30-18.00 (Pharmacy on duty Mon-Fri 8.00-21.00,Sat 8.00-19.00, Sun and Holidays 11.00-19.00)
- Supermarkets and grocery stores Mon-Fri 8.00-21.00, Sat 8.00-18.00 and on Sundays 12.00-21.00.
- Shops, boutiques, hairdressers etc. Usually opening hours are Mon-Fri between 9.00-18.00, Sat between 9.00–16.00.

FIRST AID

In case of medical help, please contact the conference info desk. The person in charge of first aid services is Ms. Elina Häkkinen, tel. +358 44 300 1271.

In case of an emergency, call the emergency number 112 (free of charge from any phone with no need for and area code). Do not call 112 for non-urgent matters.

STEERING GROUP

Adjunct Professor, Research Director, PhD **Carina Tikkanen-Kaukanen**, University of Helsinki
Vice of the steering committee, Research Director of Finnish Organic Research Institute (Organic Foods and the Environment)

Principal Research Scientist, PhD **Helena Kahiluoto**, MTT Agrifood Research Finland
Research Director of Finnish Organic Research Institute (Organic Production and the Environment)

Senior Researcher, PhD (Agroecology) **Minna Mikkola**, University of Helsini
Research Director of Finnish Organic Research Institute (Organic Food and Farming and the Society)

Professor, PhD in Political Sciences (Rural Sociology) **Pirjo Siiskonen**
Director of Finnish Organic Research Institute

LOCAL ORGANIZING COMMITTEE

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Sirpa Nupponen, Training Secretary, University of Helsinki, Ruralia Institute

Heli Peltola, Communications Planner, University of Helsinki, Finnish Organic Research Institute

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