STOA workshop
The impact of organic food on human health

Participants' booklet

WORKSHOP
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THE IMPACT OF ORGANIC FOOD ON HUMAN HEALTH

CHAIR: Miroslav Nikolov, MEP and STOA Member
MODERATOR: Daniele Del Rio, University of Parma, Italy

SPEAKERS
Stoyko Apostolov, Foundation for Organic Agriculture Breeding, Bulgaria
Philippe Godquin, University of Southern Denmark, Denmark, Denmark
Johan van Kahl, Food Quality & Health Foundation, The Netherlands
Annelie Mila, Swedish University of Agricultural Sciences and Kalmrunda Institute, Sweden
Jasmin Ouzounos, DG Enl, European Commission
Ena Brzosek-Bronka, Kurner University of Life Sciences, Nussa, Poland
Benedikt Wacker, Max Planck Institute, Konstanz, Germany

EPRS | European Parliamentary Research Service
Prepared by Gianluca Quaglio and Liliana Cunha, STOA Secretariat

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18 November 2015, 14:30-17:00
Room ASP 5E-2, European Parliament
Brussels
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1. PROGRAMME

Chair: Momchil Nekov, MEP
Moderator: Daniele Del Rio, University of Parma, Italy

14.30 Welcome and introductory remarks
   Momchil Nekov, MEP

14.35 The new EU regulation on organic production and labelling of organic products
   João Onofre, Organics Unit, DG AGRI, European Commission

14.45 Organic food and human health: is there a connection?
   Axel Mie, Swedish University of Agricultural Sciences and Karolinska Institutet, Sweden

15.05 Contribution of the organic food system to sustainable and healthy diets
   Johannes Kahl, Food Quality & Health Association, The Netherlands

15.25 Public health effects of organic production and consumption
   Bernhard Watzl, Max Rubner-Institut, Karlsruhe, Germany

15.45 Q&A session

16.00 Motivation to buy organic food vs motivation to produce organic food: the case of Bulgaria
   Stoïlko Apostolov, Foundation for Organic Agriculture Bioselena, Bulgaria

16.15 Nutrient composition of organic and conventional crops, and health effects in in vitro and animal studies
   Ewa Rembiałkowska, Warsaw University of Life Sciences, Warsaw, Poland

16.30 Public health effects of pesticide exposure in the EU
   Philippe Grandjean, University of Southern Denmark, Odense, Denmark

16.45 Q&A session

16.55 Closing remarks
   Momchil Nekov, MEP
2. ORGANIC FOOD AND HEALTH: AN INTRODUCTION

Over the last 10 years the organic food market has been characterised by dynamic development driven by strong growth in demand. The area under organic production in the European Union has doubled since 1999. Consumers have started to look for safer and better controlled foods, produced in more environmentally friendly and local systems. Organic production is an overall system of farm management and food production that aims at sustainable agriculture, high-quality products and the use of processes that do not harm the environment, or human, plant or animal health and welfare. EU consumers spent over €22 billion in 2013 on organic products, helping the EU organic market grow by nearly 6%. To help them make an informed choice, the European Commission introduced a specific EU organic logo in 2010, complementing earlier legislation setting up an extensive framework of rules and requirements on the production, processing, handling and certification of organic foods. While the sustainable nature of organic farming is generally conceded, its health and nutritional benefits are still widely debated. The use of (organic) pesticides and the possible presence of residues in organically grown crops also attract a lot of attention.

The overall number of studies analysing the safety of organic vs. conventional foods is growing rapidly. It may be surprising to know that only a small number of scientific studies have addressed the question whether organic food is more, or equally or less healthy compared to conventional food. This is because there are serious difficulties in the implementation of these types of studies. In order to measure healthiness, one would need to have a group of humans eating only organic and another one eating only conventional food, and then after a while compare which group is healthier. Nevertheless, a lot of research has been done on this topic, and some insights can be gained.

In addition, in the public debate, discussions regarding organic food are often polarized and simplified to the question if organic or conventional or neither food is “better”. Most scientists, however, are instead aiming at understanding the impact of different farm management systems on human health, animal well-being, food security and environmental sustainability, with the long-term goal of creating sustainable food systems. The public is excused for the simplified perspective because the future sustainable food is not in the shelves of the supermarkets yet, and the consumer’s decision therefore is between organic or conventional.

The STOA workshop is a good opportunity to discuss with experts from different EU countries the effects of organic foods on human health. The intention of this workshop is to give policymakers access to a review of current knowledge with respect to the question if the choice of conventional or organic foods has an impact on human health, and to discuss if available knowledge is strong enough to build policies upon.
References


Momchil NEKOV, MEP

Momchil Nekov is a Member of the European Parliament from Bulgaria since July 2014. He is member of two committees in the European Parliament – Agriculture and Rural Development and Culture and Education. He is one of the two representatives of the Committee on Agriculture and Rural Development in the STOA Panel.

Momchil Nekov is a co-chair of the Working group on Territorial Quality products of the Intergroup on Rural, Mountainous and Remote Areas in the European Parliament. He sits in the political group of the Progressive Alliance of Socialists and Democrats.

Momchil Nekov has two master’s degrees – in International Economic Relations from the University of National and World Economy - Sofia and in Political Management from Sofia University, Bulgaria. He is the author of two books and several publications in political journals and publications. Promotion of organic farming and organic food is one of his priorities in the current political term.

Key message

Investment in quality food is investment in the health of our citizens. The organic logo certifies not only qualities of production, closest to the natural ones, but also proves care for the environment and the natural resources. It is a guarantee for both qualities of the product, but also the whole production process. Organically grown fruits and vegetables according to some scientific works contain more substance and less water, which predisposes higher nutrition value. This makes organic products of vital importance in the human metabolism, which is especially important for young persons and children.

The organic farming in the EU has progressed in the last years not only in terms of land, but also in number of organic producers. This follows European citizens’ growing interest and trust in the organic production. In EP’s most recent proposal include a wide range of products, which helps our citizens have access to organically grown production. This also enables them to have a consistent impact on the food production management in a sustainable and eco-friendly manner.
4. MODERATOR

Daniele del Rio, University of Parma, Italy

Daniele Del Rio is associate professor of Human Nutrition at the University of Parma. He is running the laboratory of phytochemicals in physiology at the Department of Food Science.

He is the co-founder of the LS9 "Bioactives & Health" Interlaboratory Group, where the biological activity of human and microbiota derived phytochemical metabolites represents one of the core research topics. The LS9 Interlaboratory Group is an inter-departmental research team that comprises permanent researchers all working within the University of Parma. The group boasts a long history in the fields of bioactive metabolites, dietary interventions, and in vitro and clinical research on chronic diseases, as witnessed by publications in top journals - more than 150 over the last decade - and a plethora of world-wide conference lecture invitations. Group members are also involved in various European food and biomedical research programs (FP6, FP7, H2020) and actively collaborate with some of the most relevant International food companies.

Daniele Del Rio is an Honorary Visiting Scholar at the UK Medical Research Council Human Nutrition Research Unit in Cambridge, a Visiting Fellow of Wolfson College at the University of Cambridge as well as the Scientific Director of the Need for Nutrition Education/Innovation Programme (NNEdPro), an independent knowledge generation and research platform overseen by the British Dietetic Association.

As Scientific director of NNEdPro, Daniele holds the overall portfolio for innovation and also co-leads (along with NNEdPro Chair, Sumantra Ray) a theme of research on Non-Communicable/Cardiovascular Disease. The Del Rio Group provides cutting edge expertise in the characterisation of phytonutrients, dietary bioactives and related biomarkers, complementing existing strengths in Cambridge.

Daniele is also the new Editor in Chief of the International Journal of Food Sciences and Nutrition (Taylor & Francis, effective January 2016) and Commissioned Reviews Editor of the Journal of Human Nutrition and Dietetics (the official Journal of the British Dietetics Association). Daniele has been recently listed among the Thomson-Reuters Highly Cited Researchers (2014 and 2015).
5. SPEAKERS

5.1 João Onofre, DG Agri, European Commission

João Onofre is working as Head of the Organics in the Directorate General for Agriculture and Rural Development since 1 July 2012. João holds a Msc in Agricultural Economics by the Technical University of Lisbon and he works in the European Commission since 1994. He has a wide experience in all the areas of the Common Agricultural Policy. He held posts in the areas of rural development, state aids, markets for arable crops, Common Agricultural Policy reform (including the Food & Vegetables and wine sectors and the Health Check to help the farmers to respond better to signals from the market).

Previously (2006-2010) he was assistant of Jean Luc Demarty, Director-General of DG Agriculture and Rural Development, with responsibility for agricultural markets and international issues.

Brief note on the EU organic farming legislation

The development of organic production is a political objective of the EU. Although its organic market has constantly expanded, the EU’s organic land area still represents only 6% of the total agricultural area and the difference between EU demand and production is covered by growing imports. On March 2014, the Commission adopted a proposal for a regulation on organic production and labelling of organic products repealing Council Regulation no. 834/2007, intended to: i) overcome the regulatory and non-regulatory obstacles to the development of organic farming in the EU; ii) increase consumer confidence and address shortcomings in the control system and in the trade regime; iii) avoid unfair competition among producers and risks for the functioning of the internal market. The Commission at the same time approved an Action Plan for the future of Organic Production in the European Union. The implementation of the action plan should bring more synergies with other EU policies, help address specific needs of the organic sector and improve access to third-country markets.

On October 2015, the European Parliament AGRI Committee voted on the draft report and also voted on a mandate to launch negotiations with the Council.
5.2 Axel Mie, Swedish University of Agricultural Sciences and Karolinska Institutet, Sweden

Axel Mie is assistant professor in Analytical Chemistry at Karolinska Institutet in Stockholm, Sweden. His main research is within the Assessment of Lifestyle and Allergic Disease During Infancy (ALADDIN) cohort study with 550 children and their families, which is investigating how lifestyle and environmental factors may affect the allergy risk in children. He has a related research interest in potential effects of agricultural management practices on human health, and he cooperates with both agricultural and health scientists on this theme. Axel Mie is also affiliated with the Centre for Organic Food and Farming at the Swedish University of Agricultural Sciences, where he has recently published the popular scientific report “Organic food - food quality and potential health effects. A review of current knowledge, and a discussion of uncertainties”. Axel has studied chemistry in Greifswald and Göttingen (Germany) and in Lund (Sweden). He took his PhD in Analytical Chemistry at Lund University, and has held postdoc positions at Stockholm University and at Karolinska Institutet.

Key message

A transition towards more sustainable food systems is essential for the future of our planet. One criterion for the sustainability of a food system is its ability to provide healthy and nutritious diets. Existing systems serve as large-scale laboratories, providing experiences and data for a development towards increased sustainability. It is important to understand if and why any products, management practices or diets from any of the existing systems carry advantages for human health. Production systems should be able to develop further and learn from each other. Developments within organic agriculture, driven by the rules of organic production, contribute with solutions. Two examples: reduced pesticide use: Grey mold is a fungal pest in strawberry production, infecting the flowers and leading to quality and yield losses. The non-availability of synthetic pesticides in organic strawberry production has driven the development of a beehive with brushes dispensing spores of another fungus that outcompetes grey mold, that are delivered with high precision by the bees to the strawberry flowers. In some countries, conventional strawberry growers have started adopting this approach, which delivers strawberries free from synthetic fungicide residues. Reduced antibiotics use: the firm restrictions on the preventive use of antibiotics in organic husbandry have fuelled the development of husbandry systems that are much less reliant on pharmaceutical inputs compared to conventional systems. Preventive medication in husbandry is recognized as a risk factor for the development of antibiotics-resistant bacteria, which present a threat to human health.
5.3 Johannes Kahl, Food Quality & Health Association, The Netherlands

Johannes Kahl got his PhD in analytical chemistry. From 2001 he worked as a group leader organic food research at the University of Kassel, Germany. Since 2015 he is at Copenhagen University, Denmark.

He is chair of the Food Quality & Health Association (FQH), in The Netherlands. FQH is an international network of research institutions (universities and independent institutes). Its core activity consists in researching food quality and health, taking special account of organisms and systems, along with publishing the research results in international academic journals and presenting them to practitioners and the public alike. Additional aim is to inform society about new understandings based on scientifically sound research and thus to contribute towards a change in perception of food and its impact on health.

Key message

The regular consumption of organic food within a diet exhibits certain recurring characteristics, such as a shorter chain in terms of the degrees of separation to the primary producer. Furthermore, there is growing evidence from profiling organic consumers of significantly different dietary choices made by such groups, specifically more healthful choices. Results presented from two national studies (Germany and France) were in astonishing agreement. Regular consumers of organic products in both cohorts have healthier life-style profiles and a better compliance with the sustainable diet concept.

Since the change in consumption patterns is a crucial issue in the transformation to sustainable food systems and the consumption patterns of regular organic consumers seem to be close to the sustainable diet concept of Food and Agriculture Organization, and furthermore, since diets play a central role in shaping food systems and food systems shape diets, it seems urgent to explore the organic food system more deeply.

The organic food system, which emerged 100 years ago, has a definition, principles, standards and metrics. By now it has data from more than 160 countries, and regulations in force in more than 80 countries or regions. FQH and its partners are just developing an Organic Food System Programme (OFSP). The objective of the OFSP is to build upon lessons learnt in the organic food system to better understand elements of sustainable and healthy diets and to help countries with actionable recommendations.
Bernhard Watzl is professor and director at the Department of Physiology and Biochemistry of Nutrition at Max Rubner-Institute in Karlsruhe in Germany. He graduated in the field of Nutrition Sciences and received his PhD in nutritional immunology. During 1989-1991 he worked as Research Associate at the School of Medicine (Nutritional Immunology Group) at the University of Arizona (USA).

In 1993 he started a position as research assistant at the Max-Rubner-Institut. In 2009 he was nominated as adjunct professor at the Karlsruhe Institute of Technology (KIT, Germany). He was involved in a number of nutrition intervention studies in nutritional immunology; he also investigated the nutritional effects of phytochemicals. He has co-authored of 170 peer-reviewed research articles and reviews.

**Key message**

In recent years, studies into the quality of organic foods have increased in numbers and quality. The outcomes of recent review articles and systematic reviews indicate that compared to conventional foods, organic foods do not differ significantly in nutrient contents with a few exceptions (dry matter, nitrogen compounds, potassium). Variety and environment are clearly the dominating factors for any type of farming system and determine the nutrient content. Another question relates to the issue of defining organic and conventional foods. In reality, the opposed categories ‘organic food’ and ‘conventional food’ do not exist. Within different farming systems, the quality and price of foods can vary extremely, ranging from premium products to cheap mass-produced products.

As a consequence, process quality within one farming system can differ significantly, which does not permit the drawing of generalized conclusions about organic versus conventional products. In addition, while the European Commission has regulated the production of organic food (EC No. 834/2007), there is no comparable regulation for the production of conventional foods. For many consumers today, the motivation for buying organic food goes beyond direct personal health benefits. Issues such as animal welfare, soil fertility, biodiversity, sustainability, and the CO2 footprint of food production systems are further reasons for buying organic foods. The current motivation for buying organic foods is still driven by considerations of health. But with more knowledge of the minor differences in the nutrient contents, and a better understanding of the systemic effects of the two different farming systems, health issues will no longer be the consumer’s primary reason for buying organic foods.
5.5 Stoilko Apostolov, Foundation for Organic Agriculture Bioselena, Bulgaria

Stoilko Apostolov is a veterinarian doctor and chief of Foundation for Organic Agriculture Bioselena in Bulgaria. After working in Sofia at the Ministry of Transport, he started focusing on agriculture developing a project who aimed to promote the ideas of organic agriculture among the local farmers, science institutes and authorities.

Stoilko worked in Research Institute of Organic Agriculture in Switzerland doing consultations on organic animal husbandry and animal treatment and transferring know-how between farmers from Bulgaria and Switzerland. From 1998 he is the manager of the Foundation for Organic Agriculture Bioselena.

His works is focused on the development of organic agriculture in Bulgaria, with actions at different levels: marketing cooperative of organic farmers, credit lines for organic farmers, bodies for control and certification in organic agriculture, etc. He has contributed to the elaboration of the ‘National plan for organic agriculture development in Bulgaria 2006-2013’. He provides professional trainings in organic farming and support for national legislation under the ‘Special Accession Programme for Agriculture and Rural Development’ and the ‘National Rural Development Program’, in close collaboration with the National Committee for Organic Farming at the Ministry of Agriculture and Food.

Key message

In Bulgaria the first certified organic products were launched on the market in 2003. In 2007, the country joined the EU and started to implement National Rural Development Program 2006-2013 (CAP). Nowadays there is a boom in development of organic agriculture in the country. Over the past seven years the certified areas increased 7 times. The number of certified operators increased 13 times. Currently 1.5% of the agricultural areas are organically managed and 5% of registered farmers are engaged with organic agriculture.

Despite this significant development, many problems remain to be solved: in Bulgaria very few farms have reared organic animals (0.6% of the total number of organic farms in the country); ii) there is no production of basic foods (like eggs and meat); iii) production of cereals and oil seeds only represent 1/2 of the conventional yields; iv) most of the organic areas are not harvested (in 2014, 36% of organic products were not harvested).

Major efforts of all actors with the support of science are needed in order to merge the consumers’ expectations with the producer’s motivations in Bulgaria.
Ewa Rembiałkowska is a head of a Department of Functional and Organic Food and Commodities in Warsaw University of Life Sciences where she has worked since 1985. Before this Ewa completed a degree in biology in Warsaw University, then moving on to specialize in ecology at the Institute of Ecology Polish Academy of Science. Ewa has completed a PhD at the same Institute, next moved to Warsaw University of Life Sciences. She received a professorship in agricultural sciences in 2012.

Her main scientific achievements are connected with the evaluation of the organic food quality and impact on animal and human health. Ewa together with her team has published many papers showing that organically produced crops had better taste and contained significantly more bio compounds than the conventional ones. Ewa’s team has also proved that organic beetroot juice had stronger anti-proliferative impact on the cancer cells than the conventional one. Finally, Ewa’s team has found that organically fed rats had different physiological indicators and stronger immune system that the conventionally fed animals. Ewa Rembiałkowska is a vice-chairman of the scientific Association Food Quality and Health and a board member of ISOFAR (The International Society of Organic Agriculture Research).

Key message

According to many studies the nutritional composition of the organic crops is more profitable for humans than the conventional one. A recent big meta-analysis has proved that organic crops contain 4 times less pesticide residues and significantly less cadmium and nitrates/nitrites. On the other hand the organic crops contain significantly more polyphenols than the conventional ones. There are 2 main factors: fertilization regime and crop protection. The first factor is responsible for the lower level of the nitrates, nitrites and cadmium in the organic crops. The second factor is responsible for the higher level of the pesticide residues in the conventional vs organic crops.

According to the several animal studies, rats fed with the organically composed diet showed different physiological indicators compared to the conventionally fed animals. One indicator was that lymphocyte proliferation was significantly higher in rats fed with the organic vs conventional diet. Another study proved that chicken given organic were smaller but their immune system was stronger than the conventionally fed chicken. In addition, after infection, organic chickens started to recover quicker and were performing better than animals fed in a conventional way. On the basis of these and other studies, it is possible to assume that regular consumption of the organic food can help to improve human and animal health.
5.7 Philippe Grandjean, University of Southern Denmark, Odense, Denmark

Philippe Grandjean is professor of environmental medicine at the University of Southern Denmark, Odense, Denmark and adjunct professor of Environmental Health at Harvard School of Public Health. He is also consultant in toxicology at the National Board of Health, Denmark. He serves on editorial boards of several scientific journals and in 2002 became a founding Editor-in-Chief of the open-access journal Environmental Health. Among a multitude of committees, he served for six years on the Contaminants Panel of the European Food Safety Authority. In 2013, he became member of European Environment Agency’s scientific committee, and he also serves on the World Health Organization’s European Advisory Committee on Health Research. Most of his scientific journal publications relate to adverse effects in children exposed to chemical pollutants. His book ‘Only on chance - How Environmental Pollution Impairs Brain Development – and How to Protect the Brains of the Next Generation’ was published by Oxford University Press (2013). In 2004, he received the ‘Mercury madness award’ for excellence in science in the public interest from eight US environmental organizations, in 2012 the Science Communication Award from the University of Southern Denmark, and in 2015 the Bernardino Ramazzini Award.

Key message

A main advantage of organic food is the limitation of pesticide exposures. Although exposure to pesticides occurs from occupational operations, drift from agricultural spraying, home and garden use, and other sources, pesticide residues in conventional food is generally the main source of exposure. Recent insight into the toxic effects from pesticide exposures suggests that early-life exposures are of greatest concern, especially prenatal exposures that may harm the brain development. Many pesticides are designed to be toxic to the nervous system, but living creatures depend on similar neurochemical processes. At least 100 different pesticides have caused adverse neurological effects in adults, and they are therefore suspected of being capable of causing damage also to developing brains. Such adverse effects are likely to be lasting. However, assessment of this risk is rarely done, and most of the substances known to be neurotoxic are in current use. Four studies have been carried out in the USA to assess brain functions in children with different levels of prenatal pesticide exposure. So far, only one study from the EU has been published (the Pelagie study in France). The combined evidence suggests that current exposures to pesticides in the EU may cost as much as €150 billion per year, as calculated from loss of lifetime income due to the lower IQs associated with prenatal pesticide exposures.
6. STOA ADMINISTRATION

European Parliament
Scientific Foresight Unit (STOA)
Directorate-General for Parliamentary Research Services (DG EPRS)
European Parliament
Rue Wiertz 60
B-1047 Brussels
E-mail: stoa@europarl.europa.eu

Director-General - Directorate-General for Parliamentary Research Services
Anthony Teasdale

Acting Director, Directorate C, Impact Assessment & European Added Value
Joseph Dunne

Head of Unit - Scientific Foresight Unit (STOA)
Theo Karapiperis

Head of Service - STOA Secretariat
Zsolt Pataki

Head of Service - Scientific Foresight
Lieve Van Woensel

Administrators
Nera Kuljanic
Mihalis Kritikos
Gianluca Quaglio – Seconded National Expert

Assistants
Serge Evrard
Rachel Manirambona
Damir Plese
Anne Villers

Trainee
Liliana Cunha
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