



European Plant Science Organisation
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Workshop Draft Programme

EPSO Workshop

Addressing the Nutritional Security challenge is a strategic issue for Europe under COVID-19 pandemic

Brussels, 7.6.2021

The EPSO Nutritional Security Working Group has the pleasure to announce its second workshop entitled: “Addressing the Nutritional Security challenge is a strategic issue for Europe under COVID-19 pandemic”.

Background

Plant based foods are receiving a remarkable attention during the last decades in the research field of nutrition, due to the biological activities recognized for many classes of phytochemicals and the relevance that food nutritional security topics are obtaining in European countries. The availability and accessibility to nutritionally rich food sources are hallmarks for human health and wellbeing, that is why many efforts are being directed towards old and new generations of plant crops.

The issues related to nutrition and health are recently deserving more attention during COVID-19 since a number of risk factors for a severe COVID-19 outcome have been proposed. Among these are poor nutritional status, Non-Communicable Diseases (NCDs; which include diabetes, cardiovascular diseases, chronic lung disease), obesity and other immune-related diseases. All these pathologic conditions share a common inflammation base. The Western diet is a well-known risk factor for NCDs but also for COVID-19 since it induces a chronic activation of the innate immune system, inducing a lipotoxic state and a general chronic inflammation. Therefore, key dietary patterns, such as the Mediterranean diet (rich in fruits, vegetables, plant-derived foods, fibers, antioxidants, minerals and vitamins, and low saturated fatty acids and refined sugars), could represent a healthy nutritional intervention useful to lower the inflammation status of people at risk, including elderly people.

The access to healthy and nutritious food at reasonable prices for all the European citizens is mandatory especially under this pandemic situation, if we want to improve human wellbeing, reduce over-loading medical / hospital capacities and promote the transition to new more sustainable food systems. This is captured in the concept of ‘Diverse crops for diverse diets for human health and resilient production’.

This issue is very well linked to the UN Sustainable Development Goals (SDGs) 2 (zero hunger) and 3 (good health and well-being) proposed in the World Food Programme, and in the Farm to Fork and the Biodiversity strategies under the European Green Deal, to which the Horizon Europe Programme for Research and Innovation pays high attention.

Addressing these challenges is getting even more urgent, since new scenarios [global warming, overpopulation of metropolis, globalized trade systems, invasion/destruction of wildlife habitats, new emerging zoonotic diseases] will likely impact on our common behaviors and choices related to food and nutrition.

In this context, the EPSO 'Nutritional Security' Working Group aims to discuss and contribute to define new paths and solutions for resilient and sustainable production systems using innovative solutions in the area of food and nutrition.

Goals of the workshop

The meeting of the working group will discuss about the latest (bio)technologies which can contribute to define a new roadmap focused on 'How to achieve the Nutritional Security issue in Europe'. In addition, it will provide a report including recommendations on R&I as science advice to policy to the European Commission as well as national authorities.

Administrative information

The online workshop will be held via Zoom, hosted by IGZ.

EPSO members: We kindly ask you to **offer an inspirational note** (5 min) (name, affiliation, talk title & to which session) **by end April** for the chairs to be considered and included in the programme, and to **register for your participation** to the workshop by e-mail to Marina Korn (korn@igzev.de) **before 15 May**.

The organizers

Monika Schreiner (IGZ, *chair*), Chiara Tonelli (UniMI, *chair*), Angelo Santino (CNR, *chair*) and Karin Metzloff (Executive Director EPSO).

The Agenda:

Day 1, 15 June 2021

- 9:30 **Welcome and goals of the workshop** (Angelo Santino);
9:45 – 10:15 Tour de table (1 slide from each participant);
10:15 -10:40 **The EPSO WG Nutritional Security & COVID-19 pandemic** (Angelo Santino)
➤ Goals of the workshop
➤ How Plant Science and the NS WG can contribute to achieve the SDGs 2 (zero hunger) and 3 (good health and well-being),
10:40 – 11:00 **Horizon Europe** (incl. EU Farm to Fork and Biodiversity strategies) – **EPSO input and what is relevant in there for plant scientists** (Karin Metzloff);
11:00-11:15 Discussion;

11:15 – 11:30 *break*

Session I: Re-discovering underused species and landraces of fruits, vegetables and staple crops [Chair: **Monika Schreiner**, rapporteur: Philip Albers]

The promotion of biodiversity generates awareness on the nutritional value of plant food sources traditionally cultivated in local areas and lost in the last years due to the modern cropping systems and the requirements of modern global markets. Re-discover those

characterized by a high nutritional value can greatly help to diversify our diet, '**diverse crops for diverse diets**'.

- 11:30 - 11:40 **Introduction to the importance of the topic of session I**
[Monika Schreiner, Leibniz-Institute of Vegetable and Ornamental Crops,];
- 11:40 - 11:50 **Unleash the hidden nutritional potential of domestic vegetables**
[Susanne Baldermann, University of Bayreuth];
- 11:50 - 12:00 **Genomics-based approaches to anti-nutrient elimination in faba bean** [Stig U. Andersen, Aarhus University];
- 12:00 - 12:10 **Underused landraces as a tool to improve the environmental sustainability of tomato as a crop: learning lessons from the TOMRES, VEG-ADAPT and RADIANT EU projects**
[Francesca Cardinale, University of Turin];
- 12:10 - 12:20 **Underused landraces from South Europe with high nutritional value: learning lessons from the Biodiverso, SAVEGRAIN and TOMGEM projects;**
[Angelo Santino, CNR-ISPA Italy].
- 12:20-12:40 **Roundtable discussion on Session I**
- 12:40 End day 1

Day 2, 16 June 2021

Start 9:00 a.m.

Session II: Use of new metabolic engineering / new breeding technologies to re-design high quality crops [Chair: **Angelo Santino**, rapporteur: Marina Korn]

New genetic technologies can help to improve the metabolic pathways towards the accumulation of specific classes of healthy bio compounds in fruits and vegetables thus accelerating the development of a new generation of crops characterized by a higher nutritional value. New advances are now rapidly developing based on the gene targeting and new breeding technologies (NBTs), allowing the achievement of new frontiers in the food research area.

- 09:00 - 9:10 **Intro to NGTs and nutritional quality improvement**
[Angelo Santino; CNR-ISPA Italy];
- 09:10 - 9:20 **CRISPR/Cas9-mediated knock-out of polyphenol oxidase genes in eggplant for the improvement of the berry quality**
[Andrea Moglia; University of Turin];
- 9:20 - 9:30 **Technologies to re-design high quality crops**
[Giedrė Samuolienė; Lithuanian Research Centre for Agriculture and Forestry];
- 09:30 - 9:40 **Improving protein quality in cereals by new genomic techniques**
[Aldo Ceriotti; CNR-IBBA, Italy];

09:40 - 9:50 **High polyphenols enriched tomato lines: from a metabolic engineering approach to genome editing**

[Aurelia Scarano/Angelo Santino; CNR-ISPA, Italy];

9:50 - 10:20 **Roundtable discussion on Session II**

10:20 – 10:30 *break*

Session III: *Linking the concept of diverse diet, bioactive compounds & the prevention of human diseases* [chair: Chiara Tonelli, rapporteur: Kati Petroni].

Several studies have shown the importance of phytochemicals assumption on the immune system and the prevention of inflammation-based diseases such as cardiovascular, neurodegenerative and bowel diseases as well as obesity-associated low-grade inflammation.

Many classes of biocompounds (or their sub-products deriving by microbiota biotransformation) can provide a substantial contribution to the human gut microbiota *shaping*, in terms of microbial communities and probiotics abundances. On the other hand, a healthier microbiota profile is an important factor influencing our immunity response and general wellbeing.

10:30 - 14:40 **Introduction to the importance of the topic of session III**

[Chiara Tonelli, University of Milan];

10:40 - 10:50 **Tackling chronic diseases with anthocyanin-rich food**

[Katia Petroni, University of Milan];

10:50 - 11:00 **Harnessing the versatility of carotenoids in the health-promoting sustainable diets era**

[Antonio J. Meléndez-Martinez, University of Sevilla];

11:00 - 11:10 **High polyphenols enriched diets are effective in preventing intestinal disbiosis and bowel inflammation**

[Aurelia Scarano, CNR-ISPA Italy].

11:10 - 11:40 **Roundtable discussion on Session III.**

11:40 **Conclusions** (Karin Metzloff and chairs)

- Report with recommendations (addressing the nutritional security goal is strategic for Europe under pandemic)
- Interactions with other EPSO WGs (Plants & Microbiomes; Horticulture; AgTech)
- Outlook on future activities.

12:10 *End of the workshop.*

Contacts

Registration:

Marina Korn (korn@igzev.de);

Content:

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Karin Metzloff, EPSO, Karin.Metzloff@epsomail.org.

Useful links

EPSO: [Statement on the Draft Strategic Research and Innovation Strategy by the Biodiversity Partnership Consortium](#), 29.1.2021 (<https://bit.ly/2NNGAB9>)

EPSO: [Statement on the Farm to Fork Strategy by the European Commission](#), 2.6.2020

EPSO: [Contributions from plant science towards Nutritional Security and human health](#), Draft Statement, 11.5.2020

EPSO [Submission to the EC consultation on EU research and innovation missions \(FP9\)](#), 30/03/2018, incl. 1001 Crops – diverse crops for diverse diets and human health and sustainable production.

EPSO news: <https://epsoweb.org/news/>

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About EPSO

EPSO, the European Plant Science Organisation, is an independent academic organisation that represents more than 200 research institutes, departments and universities from 32 countries, mainly from Europe, and 2.700 individuals Personal Members, representing over 26 000 people working in plant science. EPSO's mission is to improve the impact and visibility of plant science in Europe, to provide authoritative source of independent information on plant science including science advice to policy, and to promote training of plant scientists to meet the 21st century challenges in breeding, agriculture, horticulture, forestry, plant ecology and sectors related to plant science. <https://epsoweb.org> | EU Transparency Register Number 38511867304-09