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Achieving more Sustainable Food Systems through R&I: ETP 'Food for Life' Priorities for the Horizon Europe Work Programme 2023-2024

The European Commission Horizon Europe work programme 2021-2022 was published in June 2021 and includes several topics that the food industry has itself identified as relevant. Most of these are under Cluster 6 on 'Food, Bioeconomy, Natural Resources, Agriculture and Environment', particularly in the FARM2FORK and GOVERNANCE sections. There are also some topics of interest in Cluster 4 on 'Digital, Industry and Space' where some of the R&I questions for the broader manufacturing industry could also be applicable for the food industry.

The ETP 'Food for Life' has analysed the Horizon Europe work programme 2021-2022 in the light of its own strategic documents¹ and has identified many shared R&I priorities. These include alternative food sources, sustainable packaging, food safety, microbiome and the prevention of non-communicable diseases. However, there are still important R&I gaps that need to be addressed for the next **Horizon Europe Work Programme 2023-2024** if the EU wants to achieve the ambitious policy goals set out in the Farm to Fork strategy, the Digital strategy, the Chemicals Strategy for Sustainability and the Food2030 vision, among others. These R&I priority areas, detailed in our strategic documents¹, are summarised below:

- **Improving Insights into Consumers:** Understanding consumer behaviour and responding to consumers' evolving needs, remains a priority for the food and drink sector. New developments in digital technologies and use of Big Data have led to unprecedented opportunities in this area, with great potential to also offer a bidirectional information flow that enables consumers to interact and engage in dialogue with food producers. Innovations in 'modular production' and 'Food Packaging 4.0' are related to this.
- **Modular Food Production and Distribution:** The consumer increasingly desires a local, customised, and diversified food supply. Moving in this direction would also allow a switch to more sustainable supply chains, generating less waste and better quality. Therefore, new small-scale food production approaches that can be employed on the farm and in the industry with the involvement of retailers and consumers, need to be developed. This also requires new approaches for quality and safety assessment throughout the chain, new packaging solutions, new delivery models and the direct engagement of end-users.
- **Appreciation of Diversity in Food and Eating:** The diversity of diets and the cultural aspects of food in Europe are major assets of the European way of life. We need to have better understanding of food appreciation, how it is moulded by culture, and how it modulates the way we consume food and the consequences thereof in terms of health, well-being, and sustainability. This requires further research that should include a thorough inventory of the different local traditions and ways of preparation, to allow us to make use of the wisdom and quality in traditions.
- **Understanding Food Digestion:** The current state of digital technologies allows us to have a comprehensive approach for creating an 'in silico' digestive tract, which includes the digestion of macronutrients and micronutrients and the related physiological responses and their mechanisms. This may be supported by laboratory and human intervention studies and complemented by epidemiological, Big-Data driven analyses on existing and new information. This will revolutionise our understanding of

how to design nutrition-relevant, targeted solutions, not only for large groups, but also for specific target groups or even individuals.

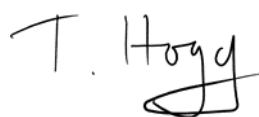
- **The Food Matrix:** With the development and use of new ingredients, it will be essential to understand how these behave in the food matrix. For example, proteins from plant-based sources, insects or those produced through biotechnological processes will have an impact in the food matrix and affect the behaviour of ingredients and products, whether from their sensory properties or their health benefits. By better understanding and using the matrix of our food we can achieve tastier and healthier diets and increase the efficiency with which we use our resources to feed ourselves. Through this the health of many sections of society can be improved, including vulnerable groups such as the elderly, young infants, the obese and people with specific dietary constraints.
- **Food Processing Technologies:** New primary processing and manufacturing techniques are important tools to help retain or enhance nutritional qualities with acceptable sensory properties. Alternative sourcing and processing methods are also key to increase the value of under-utilised side streams which might have a positive impact on consumer health and sustainability. An example of this is precision fermentation, in which proteins and other components are produced similarly to animal-based foods, improving some sustainability attributes.
- **Food Packaging 4.0:** Industry 4.0 denotes the concept of a manufacturing system with full integration of digital technologies. Not only do we need more advanced recycling technologies and alternatives for materials that are very difficult to recycle, but materials also need to become responsive and active towards the external conditions and the food, and should signal, process, and communicate with the environment.

We believe that these topics represent significant new lines of research relevant for the Horizon Europe priorities and should therefore be reflected in the work programme 2023-2024. We also stand ready to further elaborate on the themes relevant for the food industry included in the work programme 2021-2022 and expand those in the work programme 2023-2024.

Kind Regards,



Gert Meijer



Tim Hogg

ⁱ The ETP 'Food for Life' updated its [Strategic Research and Innovation Agenda](#) and [Implementation Action Plan](#) in 2021, and collaborated with other relevant platforms for a joint vision of the innovation of the agri-food sector, such as the joint statements with Copa-Cogeca ([link](#)) and the EU network of National Food Technology Platforms (NFTPs) ([link](#)), and the joint declaration of the ETP 'Plants for the Future', TP Organics, ETP 'Food for Life' on '[Translating the Green Deal into practice: Research and innovation opportunities for sustainable food systems \(2020\)](#)'. The ETP 'Food for Life' has also published a dedicated chapter '[Making Research and Innovation work for SMEs in the Food and Drink Sector](#)', elaborated jointly with the NFTPs and the European Federation of Food Science and Technology (EFFoST).