



Research & Innovation for Tomorrow's Nutrition & Food Systems

A joint contribution from the ETPs 'Food for Life' and 'Plants for the Future'

Introduction

The European Technology Platforms (ETP) 'Food for Life' and 'Plants for the Future' have established a joint task force of experts to discuss common areas of interest based on the Strategic Research and Innovation Agendas of both ETPs.

This document describes briefly the two topics identified by this task force as relevant for both ETPs: 1) Plant breeding and production for nutrient enrichment of plant-based foods, and 2) Consumer research, drivers for consumer acceptance and behavioural change.

Topic 1 - Plant breeding and production for nutrient enrichment of plant-based foods

Securing a continued supply of raw materials will surely become one of the great challenges of the 21st century. With the number of natural resources that are gradually being depleted going up and global population continuing to increase, it becomes increasingly important to address food and nutritional security, in terms of quantity and quality. Both aspects are equally important to feed the rising population and curb the increasing burden of malnutrition and micronutrient deficiencies as well as the rise of non-communicable diseases. Plant research and innovation can help achieve these goals by:

- Developing plants with improved composition for human nutrition and health
 - To identify which phytonutrients promote health and protect against chronic diseases. A careful analytical assessment of the phytonutrient contents of different plant-derived food products is also essential, as well as the effects of these phytonutrients in their whole-food context incl. developing and use of e.g. model foods.

- To identify and breed varieties with added health functionality and characterise their nutritional value. Conventional and new breeding techniques can be used to increase the content of nutrients or that of the compounds that enhance their bioavailability. Some examples are increasing the content of antioxidants or the percentage of unsaturated fats.
- To exploit the potential of the existing natural and cultured biodiversity, by improving the economic performance and value of the underutilised and often nutritious crops.
- To develop crops with added functionalities which could offer new, less refined ingredients to the food industry.
- Developing plants for optimal processing
 - To define crop characteristics that allow an optimal processing, thus connecting seed physiology to clever processing. To select and breed varieties with improved profiles e.g. less anti-nutritional factors, easy separation of ingredients, more disease-resistant.
 - To increase the value of side streams by characterising nutritionally beneficial components for food and feed which can be easily purified if needed. Understanding the composition of the starting raw material might help 'directing' valuable components into certain streams.
 - To develop new minimal food processing technologies that exploit the potential of the raw material and retain or enhance their nutritional qualities.
 - To assess and validate improved predictive models for effects of (new) processing methods and ingredients on the retention and transformation of nutrients and the impact on the digestion and bio-availabilities of nutrients.

Topic 2 - Consumer research, drivers for consumer acceptance and behavioural change

Food consumption is central to human life, not only in terms of nutritional needs, but also in terms of social, emotional, and identity-related needs. Nevertheless, consumers have become increasingly detached from the production of food. There is a need for a well-balanced debate and the involvement of the public to ensure the production of sufficient and safe food in a sustainable manner. A thorough understanding of consumer and societal issues as they pertain to foods is the basis for a rational forward-looking development in the food sector. The main priorities in this area include:

- Improving communication and outreach of society at large
 - Information flow throughout the value chain should be bidirectional. Understanding food consumption patterns and food appreciation will allow better alignment of its supply to the diversity in valuation by European consumers. In return, consumers will get access

- to the information when they need it, will profit from products better aligned to their preferences and will feel empowered in bringing about changes in the food supply.
- To improve the availability and usefulness of existing and new tools and technologies in consumer science applied to food, e.g. Big Data, quality check of the information.
 - To increase the awareness and appreciation of the plant sector among the public, using and better supporting the best examples of interactive outreach and communication strategies.
- Ensuring that any technology approach will be viewed as transparent and trustworthy by consumers
 - To look from the science base to crop production, processing and retailing, as well as from a consumer perspective to crop production and biological research.
 - To improve a public understanding of the role of the plant and the food sectors for food applications (e.g. mapping activities on what publics already know about the plant and the food sectors and what are the knowledge gaps/needs)
 - To design and implement public engagement mechanisms by involving specialists and non-specialists (e.g. multi-stakeholder platforms)

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