



Towards a European Food, Nutrition and Health Research Infrastructure

BACKGROUND.

The present European food system fails to overcome the challenges of personal, public and planetary health. Food consumption needs a shift to more plant-based foods to reduce non-communicable diseases, including obesity, and micronutrient deficiencies, whereas food production needs to keep environmental footprints within planetary boundaries. To guide EU-citizens and societal stakeholders to the healthy and sustainable diet of the 21st century, a radical food systems transformation is required, based on scientific breakthroughs and technological innovations.

CHALLENGE.

Currently, scientific expertise on diets and the food system is fragmented. This impedes the over 1,000 research institutions in the European Food, Nutrition and Health domain (FNH) to enable the necessary dietary shifts and redesign the food system. The research community needs a Research Infrastructure (FNH-RI) that helps to generate transdisciplinary evidence and expertise in order to substantiate the citizen-centred food systems transition. Positioned at the cutting-edge of fundamental and applied research in the beta- and gamma sciences, FNH-RI will reunite the disciplines by enabling data and facility sharing, training and education of future scientists, and reaching out to citizens, public and private stakeholders.

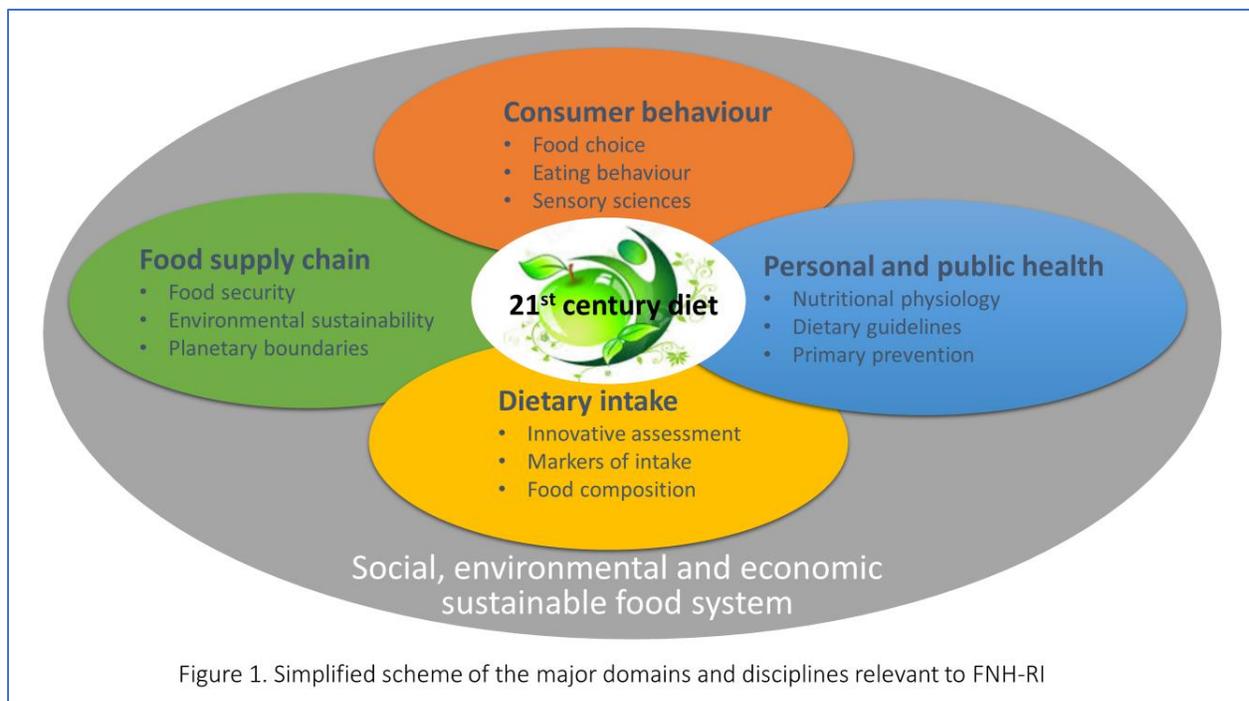


Figure 1. Simplified scheme of the major domains and disciplines relevant to FNH-RI



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IMPACT.

Through FNH-RI, the scientific community will benefit by easy access to EU-wide data on food consumption, nutritional adequacy and health impacts, environmental footprints and food loss and waste; moreover, this includes consumer preferences and attitudes, access to affordable, healthy and sustainable diets and design of urban food environments. This way, FNH-RI enables top-level science by integrating transdisciplinary data, knowledge and expertise in the beta- and gamma sciences, evolving into citizen science in a food systems framework. Governments and food industries will benefit from dedicated data-services and top-level scientific research that supports co-creation and monitoring of evidence-based agri-food and health policies. For EU-citizens this will secure the supply of healthy and affordable foods, compatible with a sustainable food system; moreover, they will benefit from innovative personalized nutrition feedback, tailored to their personal life and food environment.

SERVICES.

To achieve these objectives, FNH-RI is organized in three transdisciplinary service-layers: DATA, FACT (FACilities & Tools) and TED-services (Training, Education & Dissemination). *DATA*-services include a search engine that enables using of (meta)data from disciplinary research projects. This will facilitate meta- and pooled analyses, modelling of scenarios, monitoring of dietary behaviours, culminating in evidence-based transition pathways towards the future food system. The *FACT*-services cross-fertilize beta and gamma sciences beyond existing data. Core feature is a new unique dynamic panel of over 20,000 EU consumers that continuously harvests real-life data on determinants, food choice and intake, by using e.g. apps, sensors, wearables (citizen science) and exploiting big data by emerging technologies

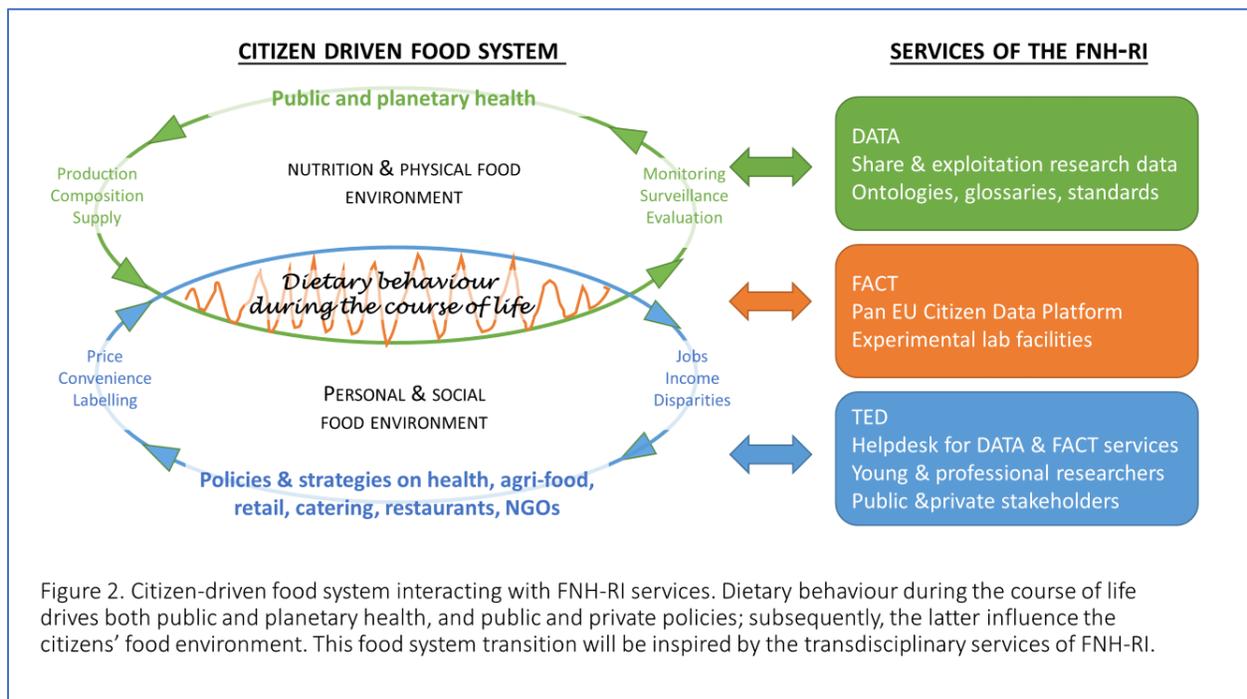


Figure 2. Citizen-driven food system interacting with FNH-RI services. Dietary behaviour during the course of life drives both public and planetary health, and public and private policies; subsequently, the latter influence the citizens' food environment. This food system transition will be inspired by the transdisciplinary services of FNH-RI.



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(e.g. machine learning and AI). Moreover, FACT-services facilitate access to top-level psychological and virtual labs for experimental research on e.g. cognition and emotion, food choice and dietary patterns, as well as bio-physiological labs on e.g. sensory sciences and neurophysiology, nutritional requirements and X-omics. Finally, the *TED*-services inspire the research community to redefine its expertise, methodology and knowledge. This will create transdisciplinary expertise by e.g. exchange of young and professional researchers, and facilitating widespread use of its services to societal stakeholders.

ORGANISATION.

Academic and public research institutes will be organised in 'National Nodes', connected to the services of the FNH-RI-Hub. The Hub and Nodes will govern the DATA-, TED- and FACT-services. The Hub is advised by an external advisory body and is accountable to the Assembly of the funding Members States. Funding originates from national governments and the EU (2021-2028, ESFRI), with increasing project-based contributions from public and private research-consortia. Connected to its research community and societal stakeholders, the FNH-RI consortium is ready to lead the ESFRI-roadmap application and subsequent preparatory and implementation projects.

