



POLICY BRIEF 2

KEY RESEARCH AND INNOVATION QUESTIONS ON ENGAGING CONSUMERS IN THE DELIVERY OF FOOD 2030

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KEY MESSAGE

Food system transformation requires major changes in food consumption practices. Consumers could play central roles to stimulate these changes, which needs to be fully recognized.

Multi-stakeholder R&I efforts should focus more on the interactions between individual, contextual and policy factors influencing consumption patterns, with specific attention to the dynamic character of food environments. Consumers should be empowered and engaged in decision making, through co-design, co-creation, co-implementation and co-assessment.

FOOD 2030 EU policy framework

The European Commission's (EC) FOOD 2030 framework aims to find solutions to the challenges facing our food systems, such as obesity, malnutrition, hunger, climate change, scarce resources and high levels of waste through Research & Innovation (R&I).

Prioritizing and integrating R&I on (1) nutrition (2) climate (3) circularity and (4) innovation is necessary for EU food systems to become future-proof - that is sustainable, resilient, responsible, competitive, diverse and inclusive.

This policy brief of the European Union (EU) Think Tank – part of the FIT4FOOD2030 Coordination and Support Action (CSA) of the FOOD 2030 initiative draws on key research findings on the multiple factors that influence food consumption practices. **Its aim is to highlight major R&I gaps which according to the EU Think Tank need to be filled to better inform policy makers as to how best enable and encourage consumers to select more sustainable diets.**

Introduction

To achieve the United Nation Sustainable Development Goals (UN SDGs) and deliver the Paris Climate Agreement our food systems need to be profoundly transformed. Achieving this **must include major changes in food consumption practices** (a notoriously difficult task). The recognition of interdependencies, such as synergies, feedback-loops and trade-offs in SDG 2 (zero hunger) between environmental, social and health issues, raises the need for a systematic approach to food system transformation. Such a **food systems approach** means that multiple actors, governance levels and policy fields need to participate in R&I efforts during the development and implementation of Food and Nutrition Security (FNS) related policies (Gill et al., 2018).

The European Commission (EC) has categorised this complexity into four priority areas for food system transformation, which align with the SDGs (box 1). Thus the R&I Food System agenda needs to consider purchasing, transporting, preparing and consuming food through to reducing and responsible disposal of waste (Spaargaren et al., 2012; Mason & Lang, 2017).





Nutrition for sustainable and healthy diets ('thematic or sectoral level'): to ensure that sustainable and healthy diets are available, accessible and affordable for all.



Climate-smart and environmentally sustainable food systems ('thematic or sectoral level'): to ensure diversity in food systems and a sustainable use of natural resources in order to stay within planetary boundaries.



Circularity and resource efficiency of food systems ('objectives level'): to implement circular principles and minimize food waste and loss across the entire food system.



Innovation and empowerment of communities ('support level'): to stimulate innovation and investment for community empowerment and to (re)connect actors and knowledge to underpin the development and implementation of Food and Nutrition Security (FNS) policies, meeting the needs, values, and expectations of society in a responsible and ethical way.

Box 1. Four priority areas of the FOOD 2030 policy framework.

The focus on food consumption practices implies the need to strengthen the role of consumers in demanding, designing, developing and implementing R&I for food system transformation. **The aim of this brief is to highlight the evidence gaps in how to engage lay consumers in transforming food systems to deliver healthy options to all in an environmentally sustainable way.** Consumers should be invited to engage in discussions both on the ethics (environmental and social) of primarily food production for everyone and on a range of issues which influence the foods they purchase (including price and affordability, but also environmental, animal-welfare and health issues) (Spaargaren et al., 2012; Whybrow et al., 2017). Moving to more environmentally sustainable diets primarily requires changes in production systems to minimise the negative environmental effects and consumers could play several roles herein (Spaargaren et al., 2012). Healthy consumption requires both knowledge of what is a healthy diet and affordable access to it (Macdiarmid et al., 2012). **Consumers need to be engaged in defining and delivering R&I** (EESC, 2016; Mason & Lang, 2017) **not just on healthy and environmental foods but for each of the four FOOD 2030 priority areas if the 2030 agenda is going to contribute to delivery of SDG 2.**

Setting R&I agendas for food system transformation needs to consider that food consumed in Europe also comes from beyond Europe through globalized markets (Spaargaren & Oosterveer, 2010). This is particularly important with respect to the greenhouse gas emissions (GHGE) associated with imported food (Sandström et al., 2018). Calculation of those costs is complex, however, and while supermarkets in Europe showed considerable interest in labelling the carbon footprints of different foods, research (Sirieix et al., 2008) showed that consumer decision-making was more biased towards organically produced food. **Thus, engagement of consumers in the process of designing the R&I agenda for food system transformation is needed so as to take into account their needs, desires and concerns from the beginning of the R&I process.** Selecting from the many established methodologies for public engagement under the EU

RTD programmes (FP7, H2020) will allow for diversity of participation and richness of opinions and visions.

Food consumption from a systems view

Food systems can be viewed as consisting of three interacting elements: *food environments, food supply chains and consumer behaviour* (HLPE, 2017). These elements are influenced by several drivers, including biophysical and environmental; innovation, technology and infrastructure; political and economic; socio-cultural; and demographic drivers (HLPE, 2017). Figure 1 is based on this framework of elements and drivers and summarises key processes that influence food consumption practices. Furthermore, it illustrates the types of policy which, in turn, will facilitate or hinder delivery of the intended outcomes.

The **food environment** has been described as '*the physical, economic, political and socio-cultural context in which consumers engage with the food system to make their decisions about acquiring, preparing, and consuming food*' (HLPE, 2017, p. 28). Important elements of the food environment include food availability, accessibility and affordability. The factors that influence these elements differ significantly around the world. Economic determinants, climate, soil conditions and technology (throughout the food value chain) prove to be the most important factors in low and middle-income countries (LMICs). In high income countries (HICs) these elements are largely determined by supply and demand interactions and regulations on production, packaging and processing. All these factors influence price, which is one of the major decision criteria in both LMICs and HICs.

Food environments are dynamic and R&I is needed to understand the role of key drivers and their influence on consumption, and how to effectively influence the food environment to provide more sustainable and healthy options in both LMICs and HICs (HLPE, 2017). Although there is a growing body of research that focusses on food choice architecture, which refers, for example, to serving sizes of meals, placement of products in supermarkets and shops, price, and marketing and advertisement of foods (Roberta et al., 2015), there is a lack of knowledge on the long-term impact of changes in the eating environment. **Moreover, there is a lack of R&I on the structural aspects that has an impact on the production and distribution of food.** For example, 'food deserts' and 'food swamps' (areas where residents can hardly buy affordable, sustainable and healthy foods, which is an increasing problem for many parts of the world) (HLPE, 2017) should be looked at as symptomatic of broader issues (such as the displacement of local food retailers by large international food retailers) rather than as causal factors in themselves (Sonnino, 2009).

Another important R&I area is the role of cultural capital (referring to knowledge, skills and values) in mediating people's access to healthy and sustainable food, which entails issues of dignity, respect, democracy and sovereignty.



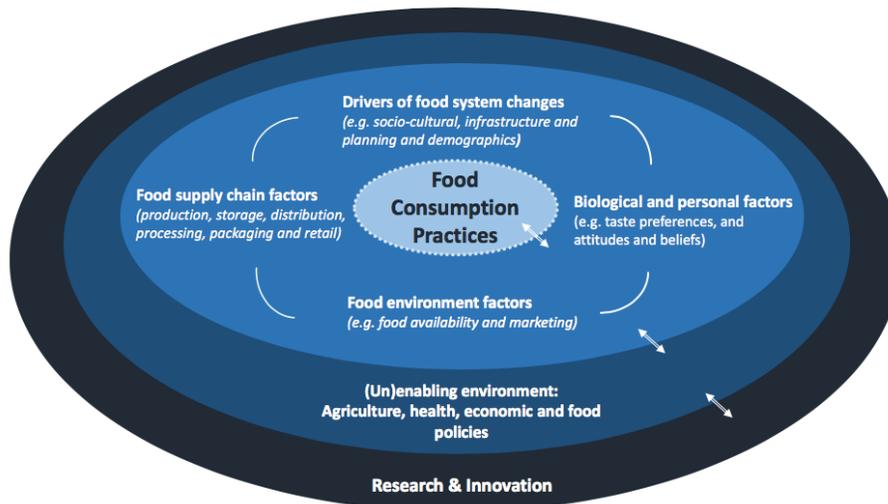


Figure 1. Determinants of food consumption practices. *This figure is inspired by the conceptual framework of food systems for diets and nutrition (HLPE, 2017).*

Important **drivers of food system changes** influencing the food environment as well as food consumption practices include **socio-cultural and demographic drivers** (HLPE 2017; Mason & Lang, 2017), which interact with **biological and personal factors**. Consumption can be viewed as a social activity situated in time and space (Spaargaren et al., 2012) and what we eat is influenced by both our social circle and our culture (Higgs & Thomas, 2016). For example, food choices are influenced by the social setting in which food is consumed, social norms, social class, income, status and family dynamics, gender, ethnicity, culture and tradition, religion, educational level, food preparation skills, knowledge, time, attitudes, convenience, taste, beliefs, aspiration and identity (Mason & Lang, 2017; HLPE, 2017). Consumer segmentation is crucial in order to better understand the diversity of consumers and how they differ in these various factors that influence food choice and as such to develop tailored (multilevel) interventions to promote behaviour change (Verain et al., 2012). Economically advanced regions such as Europe typically show changes in household setting (e.g. an increase in single-person households) (UNEP, 2015; Roberta et al., 2015). These changes, in combination with aspects such as time constraints and a potential lack of food and cooking skills (which is linked to an increased availability of convenience, processed and take-away foods further facilitated by the food service sector) are often mentioned as factors contributing to poor or unsatisfactory nutrition habits (Lavelle et al., 2017; HLPE, 2017).

Women in particular play an important role when it comes to food preparation and in many countries they are taking on more tasks related to food production (EIGE, 2016; HLPE, 2017). Also, in many countries women are often the ones making purchasing decisions, which influences consumption patterns of their families (Krivkovich & Nadeau, 2017). However, women are often disempowered because, for example, their work is often invisible and unpaid (HLPE, 2017). **More R&I is needed on how to stimulate womens' empowerment in food systems**, since this is one of the key socio-cultural drivers influencing consumer behaviour (HLPE, 2017).

Another important factor influencing consumer behaviour is a relative low level of food market transparency, combined with a high number food options (including e.g. novel foods) and a plethora of food-related information and advice (including several coexisting food labels), which leads to increased complexity of food choice (Mason & Lang, 2017). Healthy diets are not necessarily sustainable and consumers do not always know how to shift towards a more sustainable diet (Macdiarmid, 2013). A better understanding of how the public perceives their diet and what role food plays in people's everyday activities would help: i) in the design and implementation of healthy and sustainable eating initiatives (Padel & Foster, 2005) and ii) in the development of policy advice on how to stimulate citizens to change their consumption behaviour via coordinated and cross-sectoral actions (HLPE, 2017). **Therefore, more R&I is needed on understanding diversity in consumer attitudes and decision-making processes and how this relates to the food environment and the empowerment of different segments of consumers** in different parts of the world (Spaargaren & Oosterveer, 2010; Verain et al., 2012; Brug et al., 2017).

Since food consumption is strongly related to health and health care costs, there is an incentive for governments to also contribute to the general awareness and empowerment of the population on the merits of sound nutritional habits. Sustainable public procurement policies (e.g. school food reform) could play an important role in this respect (Morgan & Sonnino, 2013). Food-based dietary guidelines exist in 90 countries: 7 in Africa, 17 in Asia and the Pacific, 33 in Europe, 27 in Latin America and the Caribbean, 4 in the Near East, and 2 in North America (Bechthold, 2018; Herforth et al., 2019). These have the potential to influence the food environment provided they are effectively disseminated to consumers (Wijesinha-Bettoni, 2017). **The development of national guidelines is important and should involve different ministries (besides health also e.g. environment and education) and experts from different disciplines** (Mason & Lang, 2017). **Furthermore, R&I on how to adopt a new paradigm for nutrition education is necessary.** This is important to stimulate autonomy, capacity for reflection and (womens') empowerment, and is coupled with other food-related interventions, such as changes in



the food environment (HLPE, 2017). Innovative educational experiments are already taking place in several places around the world. An example is a community-based action research project in Vancouver (Canada), where the interaction between educational (e.g. curriculum and training) and policy interventions (e.g. procurement) in public schools was explored as a means of stimulating the transition towards more sustainable school food systems and the creation of food literate citizens. The intention was to engage the entire community of learners from educational institutions (from pupils and students to teachers, school staff and administrators, and parents) as well as community-based partners (Rojas, 2017).

Research tools & consumer views

Systems modelling (SM) is a key research tool that could complement other (inter- and trans)disciplinary methods and models. SM could be used to help understand the complexities of the interactions between the many actors within food systems and can be a powerful means of capturing the views of consumers. For example, Hammond & Dubé, 2012 and Xue et al., 2018 used models to measure the (population-level) impact of interventions and policies in food systems. This is highly relevant, since studies that aim to investigate the implications of policy-and food environment-related interventions are severely lacking (Symmank et al., 2016). Specifically, **agent-based modelling (ABM)** as a SM research approach is promising in the context of changing food consumption practices, because it allows for consumer segmentation, which is critical for the design of successful interventions into complex food systems (Hammond, 2009).

Policies for FNS R&I

Policy tools for FNS should address the entire food system, referring to the **supply side** (e.g. via subsidies, trade agreements and standard regulations), the **demand side** (e.g. via labelling and advertising) and the **food environment** (e.g. via nudging, participation and zoning) (Galli et al., 2018). Developing policies which have positive influences on both environmental and health issues, however, requires new approaches to R&I within all four FOOD 2030 priority areas.

 In Europe, the majority of policies designed to improve nutrition and food security are voluntary or mandatory standards, regulations, and information-based measures that require action to be taken by the food producers, caterers, retailers and other actors in the food chain. Biondi et al. (2019) (as part of FIT4FOOD2030) conducted a mapping exercise on food system related policies in Europe and found only sixteen policies that targeted consumers directly. Most food safety policies were designed at the European level, while the nutrition policies were typically adopted at national level. Policies directly targeting consumer behaviour mainly involve taxes on unhealthy items (e.g. energy dense and poor nutrient food products), or subsidies for producing healthy items (e.g. fruits and vegetables) (Galli et al., 2018). The relatively high level of information-based policies and voluntary regulations do not target the food environment (IPES, 2018). This is problematic given the strong interconnectedness

between the food environment and consumption practices as described above (Hawkes, 2009; HLPE, 2017). **A stronger and more systematic R&I focused on the role of the food environment will facilitate the mobilization of a broader set of policies, such as educational, mobility, and public procurement policies, which could all influence consumer habits** (Galli et al. 2018).

 Food systems have multiple impacts on the environment, with GHGs associated with production having received most attention. Springmann et al. (2018) suggested that environmental impacts could increase by 50 – 90% before 2050 if no action is taken to mitigate the effects. Mitigation actions will cost money and because the majority of consumers are unlikely to be willing to pay the true costs (Tait et al., 2016), responsibility will primarily accrue to governments. One successful example involving consumers is the introduction of a charge for single-use plastic bags to reduce the amount of plastic waste. **Research to understand which policies are acceptable to consumers and what motivates positive consumer response to these types of regulations could help identify novel policies in the context of food system transformation.**

 An issue of particular concern related to all three constituent elements of food systems, and in particular to consumption practices, is **food waste**. The amount of food waste is highly variable between European countries, but the annual amount is estimated to be 173 kg per person in the EU. **Food consumption practices have been associated with the amount of food waste in households, which are now seen as the main source of food waste in the EU and other developed countries** (Schanes, Doberning & Gözet, 2018), followed by the food service industry (Stenmarck et al., 2016). A variety of methods have been used to estimate household food waste, including collection of waste and self-reporting (Herpen et al., 2016). However, these methods often result in an under-reporting of waste. A systematic review (Reynolds et al., 2019) on downstream food waste reduction interventions found that most effective campaigns targeted food services (such as changes in plate size or type), whereas household (information) campaigns (such as usage of food sharing apps) reported only limited evidence to support their effectiveness. Given the importance of food waste reduction (SDG 12.3) and the current evidence gap regarding (cost)effective food waste reduction strategies, **R&I policies need to stimulate longitudinal and replication studies that engage consumers and take into account system effects, such as rebound or second order effects, which so far have rarely been done** (Reynolds et al., 2019).

 Innovation in food processing can enhance the nutritional value of what people consume, e.g. by using technologies that maintain vitamins throughout processing or by fortification with micronutrients. Policies can range from mass fortification to targeted fortification or market fortification where the role of policy is more regulatory in nature (Mannar & Hurrell, 2018). Advances in technology are likely to generate more radical opportunities for transforming food systems, such as the industrial production of food



without farming. However, the challenges for policy development and adoption here include public acceptance and ensuring that public health and environmental concerns are addressed. According to outcomes of the EU-project CASI (*Public Participation in Developing a Common Framework for Assessment and Management of Sustainable Innovation*) citizens' visions for a sustainable future highlight the categorical imperatives of both technological development and social change, paving the way for the pursuit of sustainable solutions that address those two critical issues in a joint and balanced manner (CASI, 2016).

Although consumption practices are highly influenced by the food supply chain and the food environment, most R&I and policy efforts are still directed towards the 'farm-gate' side of the food chain (Gill et al., 2018). However, several studies show an increase in concerns around food and sustainability, which has become an important driver for changes in food consumption practices and as such in the supply chain (Falguera et al., 2012; Spaargaren et al. 2012). Alternative (to supermarkets) opportunities for purchasing food (e.g. farmers' markets and food cooperatives) may encourage change, but their impact needs to be studied in relation to different types of consumer (Paddock, 2017). This suggests the need for R&I to better understand these limited changes in consumption practices (Spaargaren et al., 2012) and to explore the nexus between different practices to help identify more 'novel and dynamic policy interventions' for sustainable food consumption (Paddock, 2017). Simplistic and false dichotomies such as individual choice versus environmental influence regularly dominate the debate around complex food consumption related issues, which is counterproductive for addressing the problem (Roberta et al., 2015; Sonnino et al., 2019). **A systems perspective on food consumption requires new R&I approaches that can be applied to analysing what motivates different types of consumer to make their choices as well as what roles consumers could play to stimulate the change towards more sustainable food consumption practices.**

Implications for R&I and R&I policy makers

Delivery of FOOD 2030 will require significant changes to the diets of European consumers. Research has a key role to play in informing consumers of their choices and of supporting policy-makers in their decision-making. The above text has highlighted where research to date has fallen short of providing adequate evidence – this section summarises some key principles which Think Tank members consider to be priorities:

- **Research should not just involve academics.** Research aimed at promoting healthy and sustainability consumption patterns should involve co-design, and co-implementation. Involving citizens and other stakeholders who are usually not engaged in food related R&I (such as women, retailers, caterers and restaurants) in the making of research priorities is likely to raise novel topics to the research agenda and can successfully disrupt established forms of expert-based development of research

priorities (CASI, 2016). Furthermore, this is crucial for the development of a more **dynamic approach to the food environment**, both in LMICs and HICs. The Committee on World Food Security (CFS) already started elaborating on voluntary guidelines on improved food environments, using an inclusive consultative process (HLPE, 2017), which should be supported.

- **Funding mechanisms should enable long-term studies.** Longitudinal research on the most important and modifiable individual and contextual determinants of food consumption behaviour from a life-course perspective is required. There is a lack of high-quality data on the determinants of food consumption as well as of benchmarking and policy evaluation studies, which hampers the development of evidence-based policies and multilevel interventions. Therefore, funding policies should support the longevity of surveillance systems and inclusive cohort studies that are based on a systems-perspective and that use harmonised methodologies to be able to compare results from different countries (Brug et al., 2017).
- **Research should study how to encourage public engagement in changing food systems.** A growing body of literature now focuses on the role of active food citizenship, referring to e.g. alternative food networks and citizen food cooperatives that 'reconfigure the boundaries between political action and consumption' (Brunori et al., 2011, p. 5). An example of a citizen-initiated network is the Italian *Solidarity Purchase Group Group* (GAS, '*Gruppi di acquisto solidale*') (Hansink & Grasseni, 2014), which is a hybrid network in which different actors are brought together to co-create new systems of food provisioning, allowing consumers to become active agents in changing the 'rules' of the food system. More R&I is needed to identify effective strategies for mobilisation (Huang et al., 2015). Such R&I support will foster **food democracy** by better representation and inclusion of different interests (Brunori et al., 2011) and will stimulate **competence development**.
- **More research is required to support policies which target consumers.** The development of appropriate (policy) tools and instruments to empower consumers, e.g. with labelling, information tools, national guidelines and consumer guides could accelerate change. Consumers, including consumer organizations, need to be actively involved during the development of such tools to make sure they better fit actual food related consumer concerns and reduce food choice complexity (Klintman & Boström, 2012). Although food related concerns do not always translate into real changes in consumption, the 'secondary effects' of information tools, such as triggering public debate and inspiring mainstream actors to change practices are at least as important as the 'primary effects' of these tools (Spaargaren et al., 2012).

Food system transformation requires major changes in food consumption practices. **R&I policy and research agendas should provide the means for empowering consumers as drivers for future-proof food systems, through co-design, co-creation, co-implementation and co-assessment.**



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