

FEATURED ARTICLE

Will the Farm to Fork strategy be effective in changing food consumption behavior? A health psychology perspective

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Abstract

Food production accounts for one-third of greenhouse gas emissions; the Farm to Fork strategy aims to make food systems more sustainable and healthier to curb the rising global surface temperature. It includes several actions targeting consumer behavior, including increasing the availability of sustainable and healthy products and mandatory nutritional labeling. The actions address relevant psychological mechanisms; however, the outlined actions are vague and based on only a small number of behavioral determinants that may limit effectiveness. The implementation may furthermore benefit from concepts of implementation science to increase acceptability and feasibility to reach its ambitious goals.

KEYWORDS

eating behavior, behavior change, healthy diet, health psychology, sustainable diet

JEL CLASSIFICATION

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Climate change is one of the most urgent issues that humanity is facing in the 21st century. The global surface temperature is projected to rise by between 1.6 and 2.4°C until 2050, and by between 1.8 and 4.4°C until 2100. This rise will have serious consequences for life on earth and may render

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substantial parts of the planet inhabitable. It is consensus among scientists that climate change is human-made; accordingly, immediate and far-reaching action is required to reduce greenhouse gas (GHG) emissions, which are a major driver of climate change, to limit the increase in global surface temperature (Intergovernmental Panel on Climate Change [IPCC], 2021).

To achieve this goal, action is required in all domains of human life including energy generation, transportation, and food production. Accordingly, the European Commission (2019) has outlined a set of policy initiatives in the European Green Deal, which aims to reduce GHG emissions by at least 55% by 2030 compared with 1990. Since food systems account for one-third of GHG emissions, the Farm to Fork strategy is an integral part of the European Green Deal, outlining actions that aim to make food systems fair, healthy, and environmentally friendly (European Commission, 2020). However, since the required reduction in GHG emissions is drastic and needs to be achieved in a short time frame, the question arises whether the outlined actions will be sufficient to change stakeholders' behavior, including the behavior of citizens of the European Union. We will thus evaluate the potential effectiveness of the Farm to Fork strategy, as well as potential indirect/unintended consequences of the outlined actions and provide suggestions for additional actions or procedures from the point of view of health psychology, that is, the study of mind and behavior related to the promotion, maintenance, and management of health (American Psychological Association, 2020; Johnston, 1994). Furthermore, we will provide suggestions for how to improve the effectiveness of the Farm to Fork strategy and EU policy making more generally by drawing from the literature on health promotion and implementation science.

AIMS OF THE FARM TO FORK STRATEGY

The Farm to Fork strategy recognizes that far-reaching changes along the food chain from the producer (farm) to the consumer (fork) are needed to reduce the environmental impact of the food system. Accordingly, the strategy targets different stakeholders including individual food producers such as farmers, producing companies, retail and individual consumers. It specifies figures that shall be reached by 2030, such as halving the per capita food waste at retail and consumer levels. Furthermore, it includes a vision for a more environmentally friendly food system in the European Union that, for example, ensures that the food chain has a neutral or positive environmental impact and helps to mitigate climate change and adapt to its consequences. Ultimately, for the strategy to be successful, changes in the behavior of the stakeholders are required.

Especially on the level of individual consumers, the Farm to Fork strategy acknowledges the interconnectedness of human and environmental health. Accordingly, especially in the actions targeting consumers, not only sustainable, but also healthy food consumption is targeted, thus following a One Health approach (World Health Organization, 2017). Indeed, recommendations for a healthy and sustainable diet largely overlap, and there is a call for a better definition of healthy behaviors, which takes into account human and planetary health (Chevance et al., 2021). A plant-based diet with only small components of animal-based products has been shown to be most beneficial for human and environmental health (Papier et al., 2021; Willett et al., 2019). Accordingly, the Farm to Fork strategy aims to improve food consumption patterns through the following actions: (1) make the sustainable and healthy choice the easy choice; (2) facilitating the identification of sustainable and healthy products; (3) reversing the rise in overweight and obesity rates; and (4) halving the per capita food waste. All four aims require substantial changes in human behavior; therefore, evidence from behavioral science, including psychology, can be used to evaluate the potential effectiveness of the outlined actions.

UNDERSTANDING AND CHANGING HUMAN EATING BEHAVIOR IN CONTEXT

Psychology is a scientific field that aims to understand human behavior in context. Health psychology investigates the factors associated with human behaviors as these pertain to the promotion, maintenance, and management of health, health care, and self-management of chronic conditions (Johnston, 1994). Through decades of psychological research, behavioral theories have been proposed to explain human behavior and behavior change. For instance, health psychology research is advancing our understanding of the complex influences on food choice (i.e., food preferences, purchasing) and eating behavior (i.e., eating habits, cf. Stok et al., 2017). These include influences on the level of the individual (e.g., attitudes, self-efficacy), but also influences in the social environment (e.g., social norms, social support), and the physical environment (e.g., availability, accessibility; Stok et al., 2017; Story et al., 2008) as well as their interplay. Based on these insights, effective interventions for eating behavior change and maintenance have been developed (Ntoumanis et al., 2021; Stok et al., 2016). Due to substantial overlap of healthy and sustainable behaviors (e.g., consuming fruits and vegetables) and the need for behavior change in both domains, health psychologists increasingly incorporate aspects of sustainability in their research and theories (Inauen et al., 2021).

Furthermore, health psychology has developed a series of methodologies that support the development, test, and implementation of interventions (Araújo-Soares et al., 2019). Health psychology has a set of active ingredients for behavior change that targets identified mechanisms of action (Abraham & Michie, 2008), so-called behavior change techniques (Michie et al., 2013). Numerous studies demonstrate that interventions can target different sources of behavior, can have distinct functions, and be linked to varied policy categories. This complexity is well illustrated in the Behavior Change Wheel (Michie et al., 2011). This meta-theoretical framework understands the importance of contextualizing human behavior and understanding the interdependence between the distinct systems (Figure 1; Sniehotta et al., 2017). It also acknowledges how relevant policy measures are in framing the scope of action of human behavior. The actions outlined in the Farm to Fork strategy will ultimately act on different levels of this framework. Thus, expertise from health psychology can support the development of strategic documents that can ultimately change behavior through legislation.

EVALUATING THE FARM TO FORK STRATEGY FROM A HEALTH PSYCHOLOGY PERSPECTIVE

Consumers are becoming increasingly aware of climate change, its relationship with GHG emissions, its potential consequences, and the subsequent need for action (Leiserowitz et al., 2019; Umwelt Bundesamt, 2021). Accordingly, sustainability has become one of the most important motivations for food choice besides health (Bundesministerium für Ernährung und Landwirtschaft, 2021). However, despite greater awareness and increasingly positive attitudes toward sustainability, people do not yet consume a sustainable diet. Especially consumption of red meat and eggs exceeds recommendations, while vegetables, fruit, legumes, whole grains, and nuts are consumed less than recommended (Willett et al., 2019). Sustainable food consumption thus follows the same pattern that has been evident for years regarding the consumption of healthy foods: although the interest in a healthy diet is high (Statista, 2020), most people do not adhere to established dietary guidelines (Bel et al., 2019;

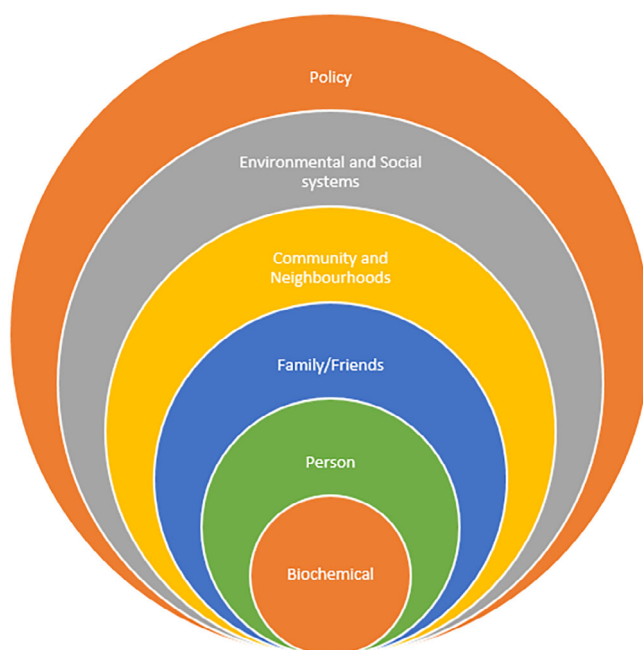


FIGURE 1 Factors influencing the initiation and maintenance of behavior of individuals and population across the lifespan (adapted from McManus et al., 2018) [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

van Lee et al., 2012). Both regarding a sustainable and a healthy diet, the gap between intentions and behavior is usually not due to lack in knowledge. Indeed, consumers' understanding of a healthy diet aligns with expert ratings (Bucher et al., 2015); consumers on average also show a basic understanding of which foods are more or less sustainable (Hartmann et al., 2021). Not meeting recommendations for sustainable and healthy diets thus seems to be a “doing problem” rather than a “knowing problem”, that is, consumers fail to put their intention and knowledge into action.

To encourage the consumption of more sustainable and healthier food products, interventions are needed that bridge the intention–behavior gap. Psychological theory has proposed several starting points for such interventions (Schwarzer, 2008; Sutton, 2008), for example, by boosting self-efficacy by providing feedback on performance, demonstrating the behavior or setting graded tasks (Connell et al., 2019; Johnston et al., 2021; Prestwich et al., 2014), or by encouraging people to form concrete action and coping plans (Sniehotta et al., 2005). Although these interventions are effective in changing behavior (Domke et al., 2021), they are typically delivered to individuals in face-to-face settings or via digital applications with insufficient uptake rates (König et al., 2018), so their impact on a population level is limited.

In addition to influences within the individual, health psychology and public health research have identified the environment as an important determinant of food choices and thus a potential starting point for interventions promoting healthier and more sustainable food consumption patterns (Araújo-Soares & Sniehotta, 2017; Hollands et al., 2017). Accordingly, researchers have called for the additional implementation of measures focusing on the environment in which food choices are made (Marteau et al., 2015). These “nudging” (Thaler & Sunstein, 2008) or “choice architecture” (Thaler et al., 2013) interventions are also rooted in psychological theory: according to dual process models (e.g., Reflective Impulsive Model,

Strack & Deutsch, 2004), behavior is guided by both reflective influences such as knowledge and self-control and impulsive influences arising from automatic reactions to stimuli in the environment such as affect. Whether reflective or impulsive influences prevail is determined by boundary conditions within the individual, for example, the availability of cognitive control resources. If these resources are low, impulsive influences take over (Hofmann et al., 2008). They typically guide behavior in the direction of positive affective associations, for example, comfort food, which is typically unhealthy, or behaviors requiring little effort, for example, choosing the default option. Researchers have thus argued for a redesign of the choice architecture so that the options that are more likely to be chosen under the influence of impulses become healthier or more sustainable (Marteau et al., 2012).

Contrary to the aforementioned interventions targeting individuals' cognitions directly through behavior and motivation regulation techniques, which can also be applied by individuals themselves (Knittle et al., 2020), changes to the environment typically require an initiation by macro-level actors, including industry and policy makers. While some countries have already implemented policies to alter or restrict the choice environment to promote healthier and more sustainable food choices (e.g., implementation of the Nutriscore in several EU member states), the Farm to Fork strategy may now pave the way for a more comprehensive regulation across the European Union, thus providing an opportunity to positively impact food consumption of its 450 million residents. Psychological theory and research can increase effectiveness of actions that could be derived from the available strategy outline and provide starting points for substantiating the plans and to ensure their effectiveness.

Making the sustainable and healthy choice the easy choice

A focal aim of the Farm to Fork strategy is to encourage food producers, processors, and retailers to improve the sustainability of their products and to reduce the environmental impact of their practices (European Commission, 2020). Through several interventions along the food chain, the availability of sustainable products in retail is supposed to increase. Indeed, research has identified availability as an important determinant of food choice (Hollands et al., 2019; Schüz et al., 2015). Importantly, availability interventions have been effective in promoting healthier and more sustainable food choices in different choice contexts; aside from supermarkets (Golding et al., 2021), interventions targeting availability of healthier options in vending machines (Grech & Allman-Farinelli, 2015), the workplace (Allan et al., 2017) and schools (Nørnberg et al., 2016) have also been effective. Since a substantial proportion of energy is consumed outside the home and meals consumed out of the home typically contain more energy (Lachat et al., 2012), it is indeed important to also target choice contexts aside from supermarkets to promote more sustainable and healthier food consumption. Similar suggestions have already been put forward by the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection at the German Federal Ministry of Food and Agriculture (Spiller et al., 2020); for instance, they suggest to provide more sustainable and healthy meal choices in canteens by making relevant quality standards mandatory.

From a psychological perspective, increasing the availability of sustainable and healthy products taps into three mechanisms that were outlined by Pechey et al. (2020). First, by changing the set of choice options, relative preferences guiding behavior may change. Second, availability of products signals a social norm. Specifically, a greater number of products from one category being present in a supermarket shelf may signal that this product is especially popular. Since individuals tend to make similar selections to what they believe others would do in the

same setting, this may bias behavior toward the alleged more popular option. Finally, greater availability of certain products also increases their visual salience; visual salience is a cue that is quick and easy to process and thus may guide behavior, especially when cognitive resources are scarce. Thus, by increasing availability, the Farm to Fork strategy may indeed reach its goal to make the sustainable and healthy choice the easy choice for consumers.

Despite the potential effectiveness of availability interventions, public acceptability is low compared with information campaigns and mandatory information on products, especially in people who frequently engage in the target behavior (Reynolds, Archer, et al., 2019; Sunstein et al., 2018). Accordingly, the European Commission may struggle to get the relevant support in the member states' governments. So far, interventions aiming to increase public acceptability of choice architecture interventions, including altering availability, by communicating their effectiveness have shown limited success: communicating a policy's effectiveness may increase support by approx. four percentage points (Reynolds et al., 2020). Little is currently known about how evidence can be best communicated to further increase support, and thus further experimental research is needed to derive best practices. Also, it is unclear whether some people may be more susceptible to persuasive messages regarding policy effectiveness. It has been previously suggested that attempts to change people's beliefs may backfire and make people even more entrenched in their previous beliefs (Nyhan & Reifler, 2010). However, since the focal mechanism of increasing policy support through information indeed induces a change in beliefs (Reynolds et al., 2018), it may be an effective strategy to increase acceptability at least in certain populations (see also Reynolds et al., 2020 for an extended discussion). Effective communication strategies thus need to be identified to accompany the implementation of the suggested actions to maximize both effectiveness and acceptability.

Introducing food labeling to facilitate the identification of sustainable and healthy products

The European Commission also plans to introduce mandatory food labeling to facilitate the identification of sustainable and healthy products. Compared with other choice architecture interventions, labeling interventions are relatively accepted (Sunstein et al., 2018); however, providing information may be less effective than other types of choice architecture interventions such as changes in presented default options or package sizes, or implementing economic incentives (Cadario & Chandon, 2020; Hartmann-Boyce et al., 2018). Nonetheless, there is evidence that especially traffic light labeling and reference intake labels may have beneficial effects on food purchasing in different settings including supermarkets and restaurants (Crockett et al., 2018; Storcksdieck genannt Bonsmann et al., 2020). Simple labels and color-coding may be especially suited since they reduce the information to one cue that is easy to process (Hung et al., 2019). They improve people's understanding of the healthiness of products (Egnell et al., 2019; Storcksdieck genannt Bonsmann et al., 2020); however, since healthiness is only one of many food choice motives (Renner et al., 2012), this does not guarantee substantial improvements in people's diets. Moreover, some studies suggest that information provision might be more beneficial in less deprived populations (Schüz et al., 2021) that already show healthier eating patterns (Petrovic et al., 2018); more deprived populations may lack the necessary literacy and numeracy skills to interpret the labels correctly (Malloy-Weir & Cooper, 2017). To avoid widening health disparities, policy

makers need to take these issues into account when advancing the plans for labeling policy (Mansfield et al., 2020).

Regarding the effectiveness of sustainability labeling, behavioral evidence and exploration of underlying psychological mechanisms are scarce. This is potentially due to the complexity of the sustainability concept including not only the immediate environmental impact of the food chain on GHG emissions and use of resources, but potentially also indirect impact on the population, society, and animal welfare (Brown et al., 2020; Lemken et al., 2021). Thus, there is need to develop a consensus on the most important dimensions to be reflected by a label and then to test its effects systematically before its implementation.

Reversing the rise in overweight and obesity rates

Although public health authorities have highlighted steadily growing overweight and obesity rates for decades and several interventions have been implemented, they were not yet sufficient to curb this development, potentially because they have focused too much on educating individuals and relying on their motivation and ability without changing the contexts in which food choices take place (Chan & Woo, 2010; Walls et al., 2011; Williams et al., 2015). Measures to increase the availability of healthy products in a range of food choice contexts, to lower their price, and to promote their selection through labeling may be effective in promoting healthier eating patterns (Hartmann-Boyce et al., 2018). For instance, based on a small number of randomized-controlled trials, Hollands et al. (2019) estimated that by reducing the availability of unhealthy snacks, energy selected per snacking occasion could be reduced by 35.6%. If these results generalized to food purchasing more broadly and also transferred to consumption—for which energy intake reduction through decreased availability was estimated to be 17.3%—energy intake in the population could be substantially reduced. However, whether the achieved changes in purchasing and consumption may actually lead to a sufficient reduction in energy intake to curb the growing overweight rates (approx. -100 kcal/day, cf., Hill et al., 2003) cannot be predicted based on the available data. High quality evidence on the effectiveness of these types of interventions is scarce (Hollands et al., 2019; von Philipsborn et al., 2019); furthermore, interventions have typically been tested independently of other interventions and under controlled conditions in a small number of sites. Whether the results generalize on a larger scale and how interventions may interact with one another remains to be tested.

In addition, the Farm to Fork strategy seeks to improve efforts to educate the public about healthy and sustainable food choices. Actions increasing people's decision-making competencies can be especially suitable if people already want to change their behavior in line with policy makers' goals but fail to enact their intentions. Accordingly, when revising educational strategies, efforts should focus on building decision-making competencies, equipping people with decision rules that fit their motivation and cognitive skills to maximize their effectiveness (Hertwig, 2017; see also König & Renner, 2019 for a discussion and an example).

Finally, changing food consumption patterns alone may not be sufficient to prevent overweight. Weight gain results from a positive energy balance, which is influenced by both energy intake and expenditure (Williams et al., 2015). Measures aiming at restricting food intake, therefore, need to be complemented by measures to increase physical activity, which is beyond the scope of the Farm to Fork strategy but generally

recognized in council recommendations (European Commission, 2013). Moreover, the European Green Deal highlights required changes in transportation to reduce GHG emissions (European Commission, 2019); these may also be harnessed to promote healthy alternatives such as active traveling and commuting through improving and extending bicycle infrastructure (Heinen et al., 2010).

Halving the per capita food waste

The outlined actions regarding the reduction of food waste, also at the consumer level, are especially vague in the draft strategy. It currently focuses on revisiting the legislation on date marking to prevent misuse by food producers and retailers and misunderstandings on the consumer side (European Commission, 2020). However, based on the available research regarding reasons for food waste in the household, this may not be the most beneficial strategy: aside from spoilage and storage, buying too much (e.g., because of distraction in the supermarket) or too large quantities (e.g., because of buying in bulk/supersizes packages, getting more value for money) and having leftovers (e.g., because more food was prepared than could be consumed by the members of the household) may play an important role (Block et al., 2016). Reynolds, Goucher, et al. (2019) have recently identified a number of interventions that effectively reduce food waste including providing consumers with information about how to reduce food waste. Further interventions targeted out-of-home consumption settings such as restaurants and schools, where reductions in plate size led to a reduction in food waste. However, since high quality evidence on the effectiveness of household food waste reduction interventions is limited and many identified potential influences on food waste have not yet been explored, further research is needed to inform policy making and practice.

The aim to reduce food waste may also conflict with (undesired) effects of other actions. For example, if consumers become aware of a more sustainable or healthy product and purchase it because of the implemented actions, it is not guaranteed that they will also like and consume it—they may discover that they, or members of their household, do not like the product, or that it does not fit to their food consumption routines and thus dispose of it. The high household food waste rates of, for example, 75 kg per capita per year in Germany (Schmidt et al., 2019) indicate that purchasing does not equal consumption, so potentially backfiring effects of all implemented interventions need to be carefully evaluated to allow for amendments if needed.

Indirect psychological effects of the actions on food choice and consumption

In the long term, the implemented actions may also induce further changes in consumer behavior by triggering additional psychological mechanisms identified as important determinants of behavior (Ajzen, 1991; Schwarzer, 2008; Sniehotta et al., 2005), such as changes in social norms or self-efficacy regarding sustainable and healthy consumption. For instance, if more people consume sustainable and healthy products, they may create an injunctive norm: through observing others making healthier and more sustainable food choices, individuals may be encouraged to engage in the same behaviors (Habib et al., 2021). Furthermore, implementing actions from the Farm to Fork strategy signals a descriptive norm, that is, that sustainable and healthy consumption is seen as a commendable behavior of citizens of the European Union. A combination of both types of social

norms may be especially beneficial to boost sustainable behavior as observed in a randomized-controlled trial (Bonan et al., 2020). Indeed, several reviews have stressed the importance of creating pro-environmental social norms in the promotion of environmentally friendly behaviors (Fritsche & Masson, 2021; Whitmarsh et al., 2021). Furthermore, seeing peers purchase and consume sustainable and healthy products may serve as a demonstration of the behavior and boost self-efficacy by engaging in vicarious learning (Bandura, 1978). Effects of the Farm to Fork strategy may thus be somewhat greater than we are currently able to estimate from the literature.

Will the actions be enough?

The effects of any intervention targeting a single behavioral determinant will be relatively small, given the large number of influences on food choice and consumption that psychological research has identified (Stok et al., 2017). Accordingly, it may be crucial to derive a larger number of actions targeting different food choice contexts to boost the strategy's effectiveness. Not all identified influences can be directly targeted by policy since there are biological or psychological traits of the individual that are largely immune to change (e.g., personality traits; physiological influences such as taste sensitivity) or would require deliberate initiation by the individual (e.g., engaging in self-regulatory interventions such as planning). However, influences in the choice architecture usually require external regulation if they are to be harnessed for promoting sustainability and health (Bandy et al., 2021). The actions currently outlined in the Farm to Fork strategy focus on altering the availability of products and providing information through labeling. Systematic reviews and frameworks (Hollands et al., 2017) provide starting points for developing further actions for impacting consumption, such as altering the proximity of products (Hollands et al., 2019), for example, removing unhealthy products from the cashier areas in supermarkets. Furthermore, not only proximity to products within supermarkets but also proximity to supermarkets themselves has been identified as a predictor of food consumption and dietary health, which could be a further avenue for designing healthier cities through planning initiatives (Fiechtner et al., 2016). In out-of-home consumption settings such as cafeterias or restaurants, using smaller tableware may reduce serving sizes, so potentially reducing both the amount consumed and the amount of food waste (Clarke et al., 2021).

The success of the strategy may furthermore be impaired by its vagueness. Actions are currently very broad and often presented without ideas for how to implement them. According to goal setting theory (Latham & Locke, 1991), effective goals need to be specific, that is, provide concrete (numerical) targets to provide a concrete benchmark to compare the current performance to. Concrete goals are provided for some aspects targeted by the strategy, for example, halving food waste, while other goals are unspecific, such as mitigating climate change. This lack of specificity spills over into the derived actions, such as revising existing policies; the revision process is likely to be more difficult if there are no concrete goals that the revision should reach. Moreover, feedback is an integral part of goal striving; the current documents poorly outline feedback loops and how different actions will be evaluated, which again negatively impacts the likelihood of goal enactment. Finally, the strategy is vague regarding responsibilities for its execution. Health psychological research has demonstrated that formulating concrete (vs. vague) plans increases the likelihood of plan enactment (Fleig et al., 2017). Furthermore, establishing responsibilities may reduce the likelihood of social loafing, that is, withholding one's contribution to a team effort, by avoiding diffusion of responsibility (Alnuaimi et al., 2010). Drafting a concrete implementation plan soon may thus be crucial for the strategy's success.

Implications for implementation, legislation, and evaluation

Psychology researchers have developed several approaches and frameworks for intervention development, such as the intervention mapping approach (Bartholomew Eldredge et al., 2016). These frameworks conceptualize six distinct steps (Araújo-Soares et al., 2019): (1) needs assessment and developing the objective(s) of the intervention; (2) conducting a thorough analysis of available evidence to understand the best mechanisms of action to target; (3) developing materials and the interface for the intervention; (4) empirical optimization of the intervention to refine it and increase acceptability and feasibility; (5) outcome and process evaluation to understand if it works or not and why; (6) implementation of the intervention.

Most importantly, the framework stresses the need of involving stakeholders at every step of the process to ensure feasibility (Goffe et al., 2019) and finally promote trust in policy making and policy acceptance (Klievink et al., 2012; Mu et al., 2018). Given the wide scope of the Farm to Fork strategy, relevant actors along the food chain should be involved in moving it forward, including representatives of food producers, industry, retail, and consumers, who can all contribute their own unique expertise on working, acting, and regulating within a specific context. Understanding key contextual constraints facilitates the development of interventions with higher chances of reaching a successful implementation stage. This engagement will increase the sense of authorship of the intervention, facilitating dissemination and increasing the potential for implementation and sustainability.

It is at the core of democracy that an elected group represents the will of the people. Nevertheless, the current “wicked problems” faced by humanity, including climate change, require in-depth knowledge provided by experts. Policy makers increasingly consult with specialists such as researchers in scientific advisory committees when drafting policy documents to harness their expert knowledge. However, those responsible for enacting, overseeing, disseminating, and implementing any new legislation should also be engaged in the process to take into account people’s diverging values, their concerns, and resolve tensions early on (see also Bouman et al., 2021; Schebesta & Candel, 2020). In the development of health behavior interventions and health care more broadly, patient and public involvement (PPI) is used to develop more effective and more sustainable interventions (Biddle et al., 2021; Byrne, 2019; Greenhalgh, 2009); intervention development frameworks and PPI could also serve as a blueprint for policy development, revision, and implementation.

The European Union is increasingly recognizing the importance of engaging the public (European Commission, n.d.); however, this has yet to be fully integrated into its legislative procedure. While the European Commission already prepares impact assessments and consults with interested parties and the public, input is usually sought via the European Commission’s website, which currently is poorly advertised. Accordingly, only a small number of citizens provide feedback, and they are not representative of the EU population. For instance, as of November 6, 2021, 14% of comments on the Farm to Fork strategy were received from the Czech Republic (European Commission., 2021), while its population only accounts for 2.5% of EU citizens. Feedback may need to be actively sought from a representative sample of citizens in addition to a wide range of organizations. Since currently written feedback is sought online without any further interaction, citizens may be unsure about how their feedback is going to be weighted in comparison to feedback provided by more powerful stakeholders and whether it will be acted upon at all, which might make people feel that this is a tokenistic exercise. Bringing stakeholders together at public events to analyze the evidence provided by experts and public officers and work together toward a common goal would facilitate the translational flow of knowledge and create a sense of ownership, which may

TABLE 1 Implications from behavioral science, including psychology, for increasing the success of the Farm to Fork strategy and European Union policy making more broadly

Actors	Recommendations
Policy makers	<ul style="list-style-type: none"> • Actively and publicly seek and engage with feedback from experts and stakeholders as often and as early as possible. Make information regarding initiatives and actions accessible and transparent. • Think beyond the implementation: Take into account acceptability and how to increase it. Provide funding to address research gaps that are required for legislative action. • Assess all actions for (non-)intended consequences to increase likelihood of success and increase efficacy of future initiatives.
Researchers	<ul style="list-style-type: none"> • Communicate your findings beyond academic circles; actively engage with policy makers (e.g., via https://ec.europa.eu/info/consultations_en). • Do not only focus on mechanistic laboratory research; also test acceptability, feasibility, and effectiveness of interventions in real-life settings. Involve stakeholders in all stages of research. • Include indicators for sustainability, for example, when studying health behaviors, to uncover their joint benefits for humans and the planet. • Research is especially needed on long-term effectiveness of choice architecture interventions and potential additive/multiplicative effects (or the potential of effects canceling each other out) of implementing multiple choice architecture interventions at once.
Stakeholders ^a	<ul style="list-style-type: none"> • Actively engage in the legislative process of the European Commission (e.g., via https://ec.europa.eu/info/consultations_en). Be proactive in your relation to political institutions. • Take into account short- and long-term consequences of the proposed actions for yourself/your family/your business/your livelihood/our planet.

^aFor example, food producers, industry, retailers, consumers.

ultimately increase willingness to contribute to reaching the goals (Baker et al., 2013; London & Smither, 2002). Although public debates involving stakeholders would increase legislative complexity, since more feedback will be received, this would also improve the resilience of the legislative process through high quality feedback and ensuring that concerns are adequately addressed. In a transparent process where diverse actors meet in prepared contexts, the social written and unwritten rules and regulations are clearer and people are more willing to share their points of view respectfully and candidly. Besides, public officials organizing such events would lead by example as their skills involve feedback provision (Baker et al., 2013; Watling et al., 2013). In this vein, it could be ensured that the end product could stand the greatest chances of acceptability feasibility and overall implementation success. Recommendations for a fruitful dialogue among policy makers, researchers, and stakeholders to improve the success of the Farm to Fork strategy are summarized in Table 1.

Finally, it will be crucial for future initiatives and continued reduction of GHG emissions to carefully evaluate the implemented actions. For instance, to date, we know little about the long-term effectiveness of choice architecture interventions (Marchiori et al., 2017). Since field studies are difficult to implement and costly for individual research teams, the Farm to Fork strategy is an unprecedented opportunity for the research community—and subsequently the public—to gain insights about the real-life implementation and effectiveness of the interventions. Linking policy implementation with research would contribute to knowledge increase and assure that every Euro invested has a bigger return.

CONCLUSIONS

The European Commission is operating on an ambitious timeline, given that some of the aspirational targets are to be reached by 2030. This timeline does not leave room for trial and error—implemented measures have to be successful on the first try. This makes it even more crucial that the implemented actions are based on scientific evidence. The Farm to Fork strategy acknowledges the complex system of food production and the multitude of systemic influences on food consumption. Ultimately, the success of the strategy will depend on its reach—the more different contexts will be targeted (e.g., food retailers, out-of-home consumption in restaurants, takeaways, and cafeterias of institutions; Hillier-Brown et al., 2019), the better. Finally, it acknowledges that human and environmental health go hand in hand. This is crucial when addressing stakeholders along the food chain with diverging interests. Most health promoting behaviors are also sustainable; by pointing out the different benefits depending on the attitudes of the target population, a greater number of people can be reached (Inauen et al., 2021).

From a health psychology perspective, actions outlined in the strategy are currently too vague to provide reliable estimates of their effectiveness. Furthermore, some of the influences on consumer behavior, especially availability, are contingent upon other measures along the food chain. If they fail to increase the availability of more sustainable and healthier products, the impact on consumer behavior will be limited. An interdisciplinary effort is thus needed to implement interventions along the food chain to ensure the strategy's success (von Braun et al., 2021).

Furthermore, policy action is largely limited to macro-level influences. Micro-level influences within individuals can only be targeted indirectly, either through indirect effects of macro-level interventions or by mandating additional action such as educational interventions in schools. Interventions on the individual level targeting well-established psychological determinants of behavior directly might still be an important lever. The effectiveness of choice architecture interventions may be boosted if goals of the individual align with the goals of the choice architecture intervention (König & Renner, 2019; Tapper et al., 2021). Instead of viewing individual and environmental influences on behavior as separate systems and one being potentially superior to the other, intervention development and policy making need to acknowledge the complexity of human behavior and implement means on both levels to effectively change consumption habits in the population (Sniehotta et al., 2017).

Finally, no matter how quickly GHG emissions are reduced, the global surface temperature has already risen, and this change cannot be reversed (IPCC, 2021). Accordingly, policy makers and intervention developers might already need to think one step ahead: instead of only focusing on implementing actions to promote mitigation behaviors, additional action is required to promote adaptation behaviors including preparative actions such as flood proofing and protective actions such as avoiding overexertion during heatwaves (Bernard, 2019; Chevance et al., 2021; Inauen et al., 2021). Those efforts should be at the heart of policy making and relevant research to adequately prepare humanity for the upcoming challenges of climate change.

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