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Food Sustainability and the Media

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<https://doi.org/10.1016/B978-0-323-91227-3.00005-6>

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# Enabling sustainable, healthful eating in the cafeteria setting through education and social engagement: the SU-EATABLE LIFE project

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## Introducing the SU-EATABLE LIFE project

The SU-EATABLE LIFE project (2018–2022) aims to demonstrate that we can achieve a substantial reduction in greenhouse gas (GHG) emissions and water usage through a series of activities, which engage EU citizens to adopt a sustainable, healthy diet at university and company cafeteria.

A third of global GHG emissions comes from the food system. The EU food system is particularly carbon-intensive, accounting for 30% of EU greenhouse gas emissions and ranking among the top six emitting economies. About half of the GHG emissions is CO<sub>2</sub>, mainly linked to land use change and energy while one-third is methane (CH<sub>4</sub>) due to livestock and rice production. Simultaneously, average dietary habits are unhealthy, inequitable, and unsustainable for the environment in wealthy and developed countries (Fanzo & Davis, 2019; Willett et al., 2019). In the EU, over half of the adult population is overweight, contributing to a high prevalence of diet-related noncommunicable diseases and related healthcare costs, and European diets are not in line with national dietary recommendations. As such, it is critical to reverse the rise of overweight and obesity rates across the EU by 2030. Moving to a more

plant-based diet with less red and processed meat and more fruits and vegetables will reduce both the risks of life-threatening diseases and mitigate the environmental impact of the food system. Tackling this issue could significantly contribute to the European Commission's target of 40% cuts in GHG emissions by 2030 (compared with 1990 levels) as well as the wider European Green Deal objective of making Europe the first climate-neutral continent by 2050. Furthermore, the Farm-to-Fork Strategy, which is at the heart of the Green Deal, comprehensively addresses the challenges of sustainable food systems and recognizes the inextricable links between healthy people, healthy societies, and a healthy planet.

Diets fundamentally determine environmental outcomes, with plant-based diets holding large potential in terms of climate change mitigation, land use, and water use (Springmann et al., 2018; Tilman & Clark, 2014; Willett et al., 2019). There is a need for a significant change in dietary habits. These changes need to be both beneficial to human health and contribute to keeping most of the critical environmental 2050 targets within the so-called "planet boundaries," that is, "the global biophysical limits that humanity should operate within to ensure a stable and resilient Earth system—that is, conditions that are necessary to foster prosperity for future generations" (Willett et al., 2019). Different sustainable dietary models can deliver up to a 55% reduction in GHG emissions and avert over 10 million deaths per year (Springmann et al., 2018; Tilman & Clark, 2014; Willett et al., 2019). More recently, governments and citizens are becoming increasingly involved in global environmental issues, driven by the dramatic evidence surrounding environmental crises such as global warming and climate change, the unprecedented extent of plastic pollution in the oceans, water scarcity, soil loss and degradation, and loss of land productivity. In this context, a global call for sustainable diets is timely and answers several of the 17 Sustainable Development Goals (SDGs), which the United Nations have set as key development strategies to be reached by 2030 to reach a sustainable and equitable world (2015). Sustainable diets could also contribute to meeting the strict requirements of the Paris Agreement to keep global warming well below 2°C and achieve carbon emissions neutrality by 2050. As such, they are an integral component of the Farm-to-Fork strategy launched by the European Commission in May 2020, which will translate into a legislative framework for implementing food sustainability from farm to fork by 2023 (2020).

### **SU-EATABLE LIFE project approach**

In response to this call for action, the interdisciplinary SU-EATABLE Life project team designed a multilevel, multistrategy approach in collaboration with universities and companies in Italy and the United Kingdom (UK). This approach included activities at the food service and consumer level. At the food service level, staff and management were invited to revise their methods of food procurement and preparation and align their food offering with the SU-EATABLE criteria for sustainable, healthful meals. These eight, science-based criteria were identified and translated into actions, which any citizen or stakeholder within the food sector (retailers, caterers, restaurants, cafeterias, municipalities) could apply to reduce CO<sub>2</sub> emissions and water use, based on changes in dietary choices. At the consumption level, cafeteria customers were invited to join on-site and online learning activities about the why, how, and what of sustainable food practices. They were invited to purchase a labeled sustainable meal in the cafeteria and exposed to

banners and posters providing information on sustainable food consumption. Online, the GreenApes mobile application provided a medium where they could participate in different types of learning challenges and earn various rewards in return. The monthly challenges comprised a set of tasks to be performed and validated on the GreenApes app. Contrary to traditional approaches, which tend to only emphasize cognitive capacities (i.e., educational/informative approach), these challenges also aimed to develop other capacities with simple tasks that stimulate reflection, trigger search for information, encourage social participation, and simplify the selection and consumption of sustainable meals.

Early 2020, these tools were launched at seven university and company cafeterias in the UK and Italy. The UK sites were selected based on an inventory of willingness to participate among university- and business-cafeteria members of the Sustainable Restaurant Association. Italian sites were selected from eligible contacts of the Barilla Center for Food and Nutrition. Due to COVID-19 restrictions, the on-site activities came to an early halt in February (Italy) and March (UK). With the gradual closure of locations and drop in customer attendance, the intervention was put on pause after running 1 month in the UK and 2 months in Italy instead of the original 4 and 6 months. In this chapter, we present the project design process and our learnings from the first stage of project activities. The chapter closes with reflections on the implications of our findings for the next stage of the SU-EATABLE project.

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## Project design process

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The first, pre-COVID version of the SU-EATABLE project was designed based on insights from literature reviews and surveys combined with theoretical perspectives on how to initiate engagement in change processes toward more healthful, sustainable dietary practices (Section 2.1). To support this, science-based guidelines were developed to establish the basis for healthy and sustainable dietary practices (Section 2.2).

### Science-based design rationale

Making the environment a priority starts at the individual level. Along with government policies, international agreements, corporate measures, and technological innovations, the choices that people make every day play a pivotal role in enhancing sustainability. Hence, consumer engagement is often put forward as the preferred outcome of efforts in the area of sustainability (Bryngelsson et al., 2016; Willett et al., 2019). In response, a wide array of behavior change techniques have been applied to reach more engagement. A pivotal role has been delegated to the food sector to facilitate such a behavioral shift, notably by creating a variety of palatable and attractive plant-based meals (n.d.-b).

Literature reviews and desk studies uncovered the following key characteristics to be included in project activities aiming to shift to more sustainable practices: (1) use clear and consistent terms to avoid confusion; (2) provide credible, relevant, and applicable information and tools; (3) address cultural and habitual food practices that are (un)sustainable; (4) connect the values of health and sustainability; (5) address individual investments needed to make sustainable choices (e.g., money, time); (6) trigger intrinsic motivation by calling upon people

to commit and act while rewarding them for doing so; and (7) create an enabling environment that considers individual, social, and environmental factors and where customers can learn about sustainable diets and take control of their learning process (Bacon & Krpan, 2018, 2016a; Böhme et al., 2018; Filimonau et al., 2017; Maher & Burkhart, 2017; Oostindjer et al., 2017).

In addition to these insights, the design integrated the Salutogenic Model of Health (SMH), the everyday-life perspective and gamification principles (Sardi et al., 2017; Van Woerkum & Bouwman, 2014). Based on these perspectives, the project design incorporated:

- *Learning experiences that increase an individual's coping capacities.* The SMH highlights the active role that people themselves play in coping with challenging situations to maintain a healthy orientation. This ability to cope is termed the "Sense of Coherence" and comprises three capacities—motivation to cope with the challenges (i.e., motivational), ability to understand the challenges (i.e., cognitive), and ability to identify and use resources to cope with the challenges (i.e., actionable). Learning experiences aim to help strengthen these capacities.
- *Activities that create an enabling environment, which facilitates and supports individuals in coping with the challenges of engaging in sustainable diets.* Based on the everyday-life perspective and the SMH, engagement entails multiple eating practices that are embedded in various practical and social activities. Project activities aimed to create a cafeteria environment that facilitated the identification and use of a broad range of resources, which could be used by food providers and customers in their learning process toward more sustainable practices.
- *A positive, practical, and enjoyable approach where the focus is less on traditional risk-oriented communication and more on a positive salutogenic and gamified approach.* This was done through educational content (e.g., videos) incorporating practical actions that individuals could take to make a positive impact. These were combined with gaming elements and social incentives within the project app to engage participants to complete challenges, win points, and claim rewards.

Lastly, a survey disseminated in Spring 2019 in Italy and the UK provided insights into perceptions regarding sustainable food and areas to target with the intervention. Findings indicated that while respondents were aware of environmental issues such as climate change, they were not knowledgeable about the impact of different foods on the environment. As such, they did not fully understand how to mitigate their environmental impact by changing their daily food consumption habits. Clarifying these concepts was therefore at the core of the intervention activities.

## Science-based SU-EATABLE principles for sustainable diets

The SU-EATABLE project adopted the definition of sustainable diet as defined by the Food and Agriculture Organization (2012), in line with the most recent criteria of food system sustainability by the EAT-Lancet Commission (Willett et al., 2019). "Sustainable diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are

protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy, while optimizing natural and human resources” (2012). It would be complex to define a single set of recommendations for sustainable initiatives, because sustainability has different dimensions. The project’s focus was on the impact of food choices on climate and water resources, translated as the carbon and water footprint (CF and WF) of food in the intervention analysis. The project elaborated eight key principles based on scientific literature evidence, the basis for a healthy and sustainable diet guiding the actions of citizens and food sector stakeholders (retailers, caterers, restaurants, cafeterias, municipalities). To quantify the carbon and water footprints of food commodities, the project created a specific multilevel carbon and water footprint database (Pettersson et al., 2021).

The eight principles in brief:

1. *Champion plant-based food in your diet: Make vegetables, legumes, nuts, and fruit the basis of our daily diet.*

Emphasizing nutrient dense, plant-based foods is associated with significantly better health outcomes (n.d.-a; Satija et al., 2017; Satija et al., 2016; Toumpanakis et al., 2018; Tuso et al., 2013). A healthy diet includes: fruit, vegetables, legumes, nuts, and whole grains, with at least 400 g (i.e., five portions) of fruit and vegetables per day, excluding starchy roots such as potatoes (2018). Diets rich in plant-based food also have a lower environmental impact. Plant-based food grown in open fields has a lower average impact of one to two order of magnitude compared with animal-based food (Pettersson et al., 2021), with the consumption of red meat marking the biggest difference. Substitution of red meat with legumes can lead to savings as much as 2.5 kg CO<sub>2</sub> equivalents and 1000 liters of WF per meal. To date, individuals in high-income countries tend to consume too much sugar, oils and fats, red meat as well as milk and cheese combined, while not enough fruits and vegetables (Vanham & Bidoglio, 2013; Willett et al., 2019).

2. *Enjoy meat in moderate amounts: Enjoy meat in moderate amounts, especially red meat and processed meats.*

Meat production significantly affects climate change, as the “impacts of the lowest-impact animal products typically exceed those of vegetable substitutes.” At the highest end of CO<sub>2</sub>-eq emissions is ruminant meat, i.e., beef and lamb, which can be almost 10 times higher than poultry, eggs, rabbit, and most fish and four to five times higher than pork (Pettersson et al., 2021; Poore & Nemecek, 2018). In terms of pressure on freshwater resources, meals that include beef have three times the WF as those that include other meat protein sources (pork, chicken) or legumes and twice the WF of eggs (Mekonnen & Hoekstra, 2010; Pettersson et al., 2021). Daily intake of processed meats increases, and high intake of red meat (i.e., beef, veal, pork, and lamb) increases risk of cancer (2015b), cardiovascular disease (Abete et al., 2014), stroke, and type 2 diabetes (Chen et al., 2013; Feskens et al., 2013). Processed and unprocessed red meat was linearly associated with total mortality, suggesting that optimal intake should be low (Willett et al., 2019). Such risks can be significantly diminished by substituting other protein sources for red meat (Pan et al., 2012), in particular plant sources of protein and consuming no more than 100 g of red meat per week. Consumption of poultry has been

associated with better health outcomes and can be in the order of 200 g per week, up to 400 g per week (Willett et al., 2019).

3. *Enjoy dairy products in moderation: Consume dairy products, including milk, in moderation.*

Dairy products, in particular cheese, may have a CF and WF higher than eggs, poultry, and fish (Pettersson et al., 2021). Cheese has a neutral impact on health if the intake is moderate, that is, no more than three servings per week (Guo et al., 2017). Plain yogurt and milk have a lower impact on the environment compared with cheese. Butter has a CF about four times higher compared with nontropical vegetable oils and conveys a higher risk of cardiovascular disease. Hence, nontropical vegetable oils should be preferred whenever possible for cooking and food preparation (Willett et al., 2019).

4. *Avoid too much food: Avoid having too much food on your table and in your daily diet to avoid excess calories and food waste.*

Every kilogram of food carries the embedded environmental impact generated during its production, processing, transportation, and packaging (Clune et al., 2017; Ecrin et al., 2011; Vanham et al., 2018; Willett et al., 2019). To reduce the pressure on the environment, we need to not only balance the composition of our diet but also to reduce the portions of food we consume. A dietary shift combined with reducing our food waste might help us to reach important sustainability targets in terms of climate change and water use (Willett et al., 2019). Energy intake should be in balance with energy expenditure (2018). Excess energy intake (i.e., energy-dense unhealthy dietary patterns) is the most significant dietary factor related to weight gain and the development of obesity (Roberts et al., 2002) and contributes to increasing the environmental impact of the food sector.

5. *Celebrate variety: Vary your diet with the seasons and enjoy regional products and local varieties.*

Agrobiodiversity is an important strategy to face the challenges of climate change, as it offers more flexible climate adaptation strategies, thus supporting food security and resource saving (Fischlin et al., 2007). Coupling variety while highlighting seasonal and local products could help boost local economies and save resources. Seasonality has significant implications for C footprint impact, with the CF of vegetables and fruits grown in heated greenhouses being up to fourfold (Clune et al., 2017; Pettersson et al., 2021) than that of open-field vegetables and fruits. Generally, only when local markets are affected by seasonal constraints, which strongly limit food variety (cold climates), long-distance supply chains may be more advantageous compared with greenhouse food production or with long-term food storage throughout the seasons (Wakeland et al., 2012). Dietary diversity has been recognized as a key element of high-quality diets and is also a proxy for nutrient adequacy of the diet of individuals (Ruel, 2003). Agrobiodiversity is an underexplored avenue for giving both food producers and consumers access to greater dietary diversity (Johns & Eyzaguirre, 2006).

6. *Fresh is best (for you and for the environment): Favor fresh and naturally prepared food in your diet*

Food processing can add further pressure on the environment. The more complex the processing, the higher amount of energy and materials required, which leads to higher CO<sub>2</sub>-eq emissions and resource consumption per kilogram of product (Notarnicola et al., 2017). The increasing proportion of ultraprocessed foods in diets has been identified as a driver of excess energy intake (Hall et al., 2019). Also, the evidence

thus far shows that displacement of minimally processed foods and freshly prepared dishes and meals by ultraprocessed products is associated with unhealthy dietary nutrient profiles (Monteiro et al., 2018).

7. *Drink tap water whenever possible and safe: Drink plenty of water, choosing tap water over bottled water whenever it is possible and safe.*

When safe tap water is available, water in plastic bottles places an unnecessary burden on the planet. Bottled water creates additional CO<sub>2</sub> emissions (Botto et al., 2011) and water consumption (Niccolucci et al., 2011). Bottled water in plastic material poses a further environmental burden, as plastic production relies heavily on oil (Foolmaun & Ramjeawon, 2008), and the amount of plastic recycled in many EU countries is still less than 50% of the production (PlasticsEurope, 2017). Good hydration is vital for good health and well-being. Water safety and quality are fundamental to human development and well-being, and 71% of the global population uses a safely managed drinking-water service (2019). One of the reasons for increased bottled water consumption seems to be consumer dissatisfaction with tap water characteristics that affect taste, odor, and sight, even in countries where tap water quality is considered excellent (Doria, 2006).

8. *Reduce single-use: Reduce, reuse, and recycle food packaging by bringing your own bags, cups, and cutlery whenever possible. Choose food with minimum packaging and recycle and reuse materials whenever possible.*

Food packaging represents an important fraction (25%) of the plastic materials that leak into the environment. The estimated annual input of mismanaged plastic waste to the ocean is about 13 million metric tons (Jambeck et al., 2015). This plastic remains in the ocean for centuries, causing harm to natural systems. Shopping for food in supermarkets has shown to have three times the CF per food basket than shopping in local food markets, due to the higher amount of packaging in supermarket food. Retailers could save a great deal of CO<sub>2</sub> emissions by helping to reduce food packaging, while users could significantly reduce the environmental footprint of their food basket by recycling or bringing their own shopping bags (Sanyé et al., 2012).

## SU-EATABLE project design and evaluation—stage I

The design rationale and SU-EATABLE sustainable diet principles led to the first stage of activities at food service and customer level in seven cafeterias in the UK and Italy with the intention of running 4–6 months. The activities aimed to create an enabling environment for sustainable food service and consumption by initiating positive and practical learning opportunities while implementing the dietary principles in the canteens.

### Engagement activities

#### **Food service level**

Several engagement activities were conducted at the food service level (Fig. 7.1). Firstly, staff and management were invited to revise their methods of food procurement and

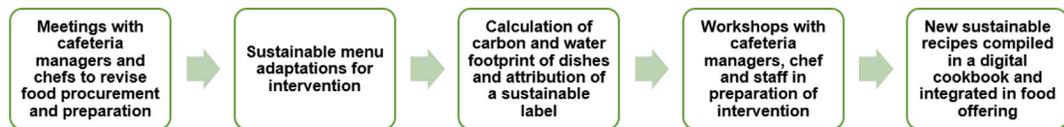
preparation and align their food offering with the SU-EATABLE criteria for sustainable, healthful meals. A series of meetings were held with cafeteria managers and chefs to understand the current food offering and menu structure after which menus were analyzed according to the eight principles for sustainable diets. In this way, cafeteria managers and chefs were involved in the sustainable learning trajectory. In particular, aspects such as the offer of red meat dishes, seasonality of ingredients, and offer of low environmental-impact healthy dishes were assessed. One-to-one proposals for changes in the food offering were discussed for the intervention phase. The majority of changes involved protein foods, such as the substitution of red meat with poultry, the reduction of cheese as a recipe ingredient, the inclusion of more legume-based dishes, as well as the inclusion of eggs and fish with lower environmental impact. In addition, the carbon and water footprints of each dish were calculated to attribute the sustainable label to dishes sold in the cafeteria and validate the chef recipes for the communication strategy with cafeteria users. Workshops were held with cafeteria chefs, managers, and staff in order to provide the scientific background for the eight principles, cocreate the experimental phase, and discuss sustainable menus and recipes. Following the establishment of new sustainable recipes with cafeteria chefs, all of them were compiled in a webpage to create a digital cookbook, inviting cafeteria users to choose the dish in the cafeteria when it was offered, and prepare it at home with family and friends. [Fig. 7.1](#)

### **Customer level**

Customer-level activities were launched early 2020 in all intervention cafeterias ([Fig. 7.2](#)). A baseline customer survey was administered before the start of activities.

In the cafeteria setting, customers were invited to purchase the sustainably certified meal and exposed to banners and posters providing information on sustainable food consumption to promote an enabling environment toward the consumption of the new dishes.

Online, the GreenApes app provided a learning medium where users could participate in different types of challenges and earn various rewards in return. This approach embedded the learning in a positive, practical, and enjoyable way. Monthly challenges comprised a set of tasks to be performed and validated on the GreenApes app. Contrary to traditional approaches, which tend to only emphasize cognitive capacities (i.e., educational/informative approach), these challenges also aimed to develop other capacities with simple tasks that stimulate reflection, trigger search for information, encourage social participation, and simplify the selection and consumption of sustainable meals. Each monthly challenge introduced customers to different aspects of sustainable diets, and six out of the eight SU-EATABLE principles were selected to be covered over a period of 6 months of



**FIGURE 7.1** Stage 1 engagement activities at the food service level. This figure overviews the engagement activities deployed at the level of food service.

experiments. An exception was made in two universities, where only the first 4 months of experiments would be conducted, matching the duration of the school semester.

Each month, challenge activities targeted the three elements of an individual's sense of coherence: (1) comprehensibility—understanding the characteristics of sustainable food choice, using knowledge and tools to make informed choices (cognitive capacity); (2) meaningfulness—being aware of and able to construct and assign meaning and value to sustainable food choice, being motivated to invest in sustainable food choice and intend to make this choice (motivational capacity); and (3) manageability—perceived self-efficacy and control over required social and practical skills needed to eat sustainably (actionable capacity). These three capacities are closely interlinked, where an increase in one capacity is likely to drive the other(s). For instance, increasing one's ability to understand what comprises a sustainable diet (cognitive capacity) could also result in an increased ability to select more sustainable options among different cafeteria dishes (actionable capacity). To complete a challenge, participants were invited to (1) watch a short educational video that addresses the topic in a positive light and shares a few practical tips, (2) consume an increasing number of sustainable meals each month by validating their purchase in the app, and (3) share a user story in response to a question or activity that requires reflection or action. Completing a challenge was rewarded with a physical, social, or collective reward to test the effect of different rewarding systems (Fig. 7.2).

## Intermediate evaluation stage I

Due to COVID-19 restrictions, the on-site activities came to an early halt in February (Italy) and March (UK) after running 1 month in the UK and 2 months in Italy instead of the original 4 and 6 months. An intermediate evaluation was conducted hereinafter including the analysis of: (1) the baseline customer survey, (2) the baseline extended customer survey (survey the users filled in after downloading the app), (3) sustainable meal purchases during the intervention period, and (4) engagement in challenges during the intervention period (Table 7.1). In addition, cafeteria customers and staff were interviewed to gain insights into participation and engagement during the short initial launch (Table 7.1).

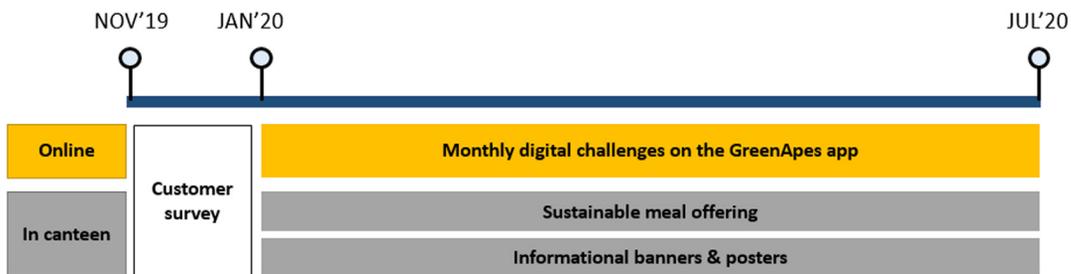


FIGURE 7.2 Stage I intervention timeline for cafeteria users. This figure overviews the timeline of intervention activities for cafeteria users.

TABLE 7.1 Baseline and intermediate monitoring and evaluation methods.

	<b>Month 0 Baseline Evaluation</b>	<b>Month 2–3 Intermediate Evaluation UK: Jan-Mar 2020 (2 months) IT: Feb-Mar 2020 (1 month)</b>
Sales & procurement data	<i>Baseline sales and procurement data:</i> collected in Nov–Dec 2019 before online baseline surveys were conducted	<i>Monthly sales and procurement data:</i> collected at the end of each month of experiments
Baseline survey	<i>Baseline survey (n = 595):</i> food choice motivations, current sustainable food practices and capacities underlying a change towards sustainable diets	<i>Analysis of baseline survey</i>
GreenApes app	<i>Baseline extended survey (n = 46):</i> food choice motivations, sustainable eating and lifestyle, self-identity and perceptions on sustainability	<i>Analysis of: Baseline extended survey</i> <i>Sustainable meal purchases:</i> monthly tracking of sustainable meals validated with GreenApes app <i>Engagement in challenges:</i> completion of challenges
Interviews and consultations	N.A.	<i>Informal interviews and consultations with cafeteria staff</i> <i>Interviews with cafeteria customers in the UK (n = 18) and IT (n = 3) to evaluate participation and engagement</i>

### **Food service level**

Based on interviews and consultations with cafeteria staff, there was generally high interest and support from management and caterers. However, several challenges emerged during the initial 2 months of experiments (Table 7.2). The intermediate evaluation emphasized the importance of fostering a shared leadership in the implementation of project activities, reducing complexity and providing easy-to-follow informational resources. In addition, it underlined the importance of integrating project activities into the job routines of workers involved in the intervention deployment. Applying the learnings outlined in Table 7.2 is important to make the intervention more sustainable and the personnel more resilient to the challenges of implementing a change in their food offering (Table 7.2).

### **Customer level**

Customer-level data included insights from the baseline survey, baseline extended survey, and GreenApes analytics. The following main insights were uncovered from the analysis of the two baseline surveys:

- *Country differences in food motivations:* consumers in Italy found it most important that food is healthy and good for the mood, whereas consumers in the UK considered it should be affordable, satisfying, and enjoyable. Promoting sustainable food should therefore address specific top drivers of food choice in each country.
- *Affordability of food in universities:* affordability is very important to cafeteria-goers in universities, where economic incentives could be most effective to promote sustainable foods.

TABLE 7.2 Challenges and learnings on engagement of cafeteria staff and management.

Challenge	Learning
1. <i>Complexity of project elements</i> While the main site contact person is a close collaborator and understands the project elements, effort is required as there can be a lack of understanding concerning the importance of certain project elements (e.g., menu)	Simplification of project elements and steps to be taken for participation Clear materials explaining the project that can be handed out to staff
2. <i>Internal coordination issues</i> Changes in key coordinating person over the course of the project could result in less internal drive to realize project activities, as well as a loss of information	Clarity in expectations and information should be established in the beginning, with supporting materials
3. <i>Knowledge of sustainable diets</i> Cafeteria staff and chefs demonstrated very limited and inaccurate knowledge about sustainable diets. This contributed to a lack of understanding about the “OPP” and “MP4TF” sustainability meal labels and sometimes led to menu changes that the labels were not suited to	Single workshops are insufficient to establish understanding and autonomy. Provide caterers and chefs with simple tools that improve their understanding and enables them to be flexible with meal offerings and to champion sustainable diets
4. <i>Role of the chefs</i> Chefs determine what food ends up being served and how tasty it is, but time, motivation, skills and understanding of sustainable diets seem to be lacking. This needs to be addressed if the key motivations of cafeteria customers when picking meals (i.e.: perception meals are “satisfying & enjoyable,” “healthy” and “good for mood”) are to be fulfilled	Providing incentives for chefs to expand their repertoire and serve more tasty sustainable meals. Source opportunities for inspiring chefs on the possibilities without creating additional load into their daily jobs
5. <i>Food culture &amp; consumer demand</i> The catering business is strongly driven by consumer demand, and when meat-based dishes are perceived as comfort food (e.g., lasagna in Italy), it is difficult to replace them on the menu	Explore and add local plant-rich dishes to the menu (many of which are already popular amongst consumers) and expand the choice range rather than limiting meat.
6. <i>Time</i> The catering service is fast paced. Project activities required additional time investments (e.g., separate counter to scan QR code, weighing and calculating food) and are not sustainable over time for replication	Technological capabilities for automation should be a requirement for participation. Additional time investments should be avoided or established upfront so that additional manpower can be assigned
7. <i>Internal investment of resources</i> Management staff welcomed the project due to the alignment with health and environmental goals of their organization, but did not channel budget or resources	Establish a win-win relationship from the start where a commitment of specific manpower and financial resources should be negotiated
8. <i>Lunch vs dinner</i> Particularly in Italian cafeterias where dinner is also served, there is less of a time pressure compared to lunch. However, project activities were geared towards the lunch crowd	Consider implementing project activities also for dinner time in cafeterias where dinner is served

- *High interest but low actionability:* the high level of awareness and interest in sustainable diets were accompanied by a relatively lower perceived scores in social desirability of sustainable eating and ability to select sustainable foods. This suggested that more attention could be given to creating an environment and tools that support people in integrating sustainability into their everyday life.

- *Learning with low effort*: learning modes that involved more effort (e.g., taking part in challenges) and social interaction (e.g., peers, discussion events) were less preferred. Hence, for experiential and social learning where active participation is required, fun elements, meaningful rewards, and food enjoyment could help to trigger interest and intrinsic motivation.

The data from the GreenApes app from the first months of the intervention showed that only a small fraction of cafeteria users had downloaded the app ( $n = 244$  across the seven cafeterias). Approximately half of those who registered scanned their first meal ( $n = 111$ ), but only a third of them ( $n = 38$ ) proceeded to complete the welcome challenge ("Challenge 0"). Of these users, only five proceeded to complete Challenge 1 of which four claimed the reward after completing the challenge. Increasing the value of rewards for completing the second challenge did not result in significant improvement in participation levels. This trend was consistent across all cafeterias and shows low level of engagement and participation.

These combined findings signaled that the app content needed to be adapted and the reach increased for stage II of the intervention. They also indicated the areas to work on in order to make the challenge content more relevant for the users. In addition, important new insights were gained from the interviews with cafeteria customers, see [Table 7.3](#).

### The way forward: stage II of the SU-EATABLE LIFE project

The interruption of experiments due to the COVID-19 pandemic provided an opportunity for the project team to revisit the approach and adapt the engagement activities to the context, perceptions, and challenges of the cafeteria stakeholders and customers. The current events highlighted the importance of prioritizing the replicability of experiments in different settings, fostering internal ownership, and providing the necessary tools and information for stakeholders to lead project activities internally with minimal support from the SU-EATABLE LIFE project team.

In line with other research and initiatives to promote sustainable behavior in citizens (James, 2010), lessons from the evaluation also showed the importance of positive framing, knowing the audience, and simple and concrete messaging. Next to that, fitting project activities within the routines of customers and staff, and providing them with the tools for flexibility and creativity without restricting their freedom of choice could be an important step toward empowerment and engagement. Moreover, food choice in the cafeteria was shown to be largely driven by taste, health, and affordability. Other studies have shown that successfully reducing the offer of animal-based products in food service requires chefs to reinvent meals and give consumers a sense of how tasty sustainable cuisine can be (Lopez et al. 2019). [Table 7.4](#) summarizes the focus areas for the adaptation of engagement activities for the relaunch.

Based on the learnings, the project team is working toward several adaptations to the project activities to ensure replicability, increase participation and engagement, and adjust to the uncertainties of COVID-19 times:

TABLE 7.3 Evaluation of project activities and learnings for adaptation.

Dimension to be addressed	Learnings to be applied
1. <i>I come to eat not to read</i> People do not especially take the time to read, process and understand multiple guidelines and steps they need to take to participate	Very simple messaging is needed Communication materials should be located at decision-making points or places where people have time to read
2. <i>A place for relaxation and enjoyment</i> People do not want to be disturbed and do not want to make much additional effort during their lunch time	Participation should be integrated as much as possible into the regular lunch routine Decrease material to be filled
3. <i>Seeking tasty, healthy, familiar foods</i> Food choices are driven by food preferences and habit. Although the labeling of sustainable meals do trigger a few people to choose something different, sustainability is not usually considered	Offer a broad range of popular plant-rich foods and promote them. Focus on the enjoyment of sustainable meal offerings, and offer a free taste of new dishes
4. <i>Poor understanding of sustainable diets</i> Despite interest in the topic, most people show a very limited understanding and poor ability to grasp the guidelines	Simpler messaging but offering possibilities to learn more (e.g., through the GreenApes app)
5. <i>No awareness about learning experience</i> The fun learning experience that the challenges provided on the app was not communicated clearly, and people were not aware of it	More publicity about the learning experience Creating learning activities in the cafeteria that link to the app (e.g., guess the impact competition)
6. <i>Value for money</i> Many bring their own food to limit expenses especially in university cafeterias, whereas participation in the project is very much based on purchasing meals. Many also don't consider the meals to be value for money	Economic incentives for buying sustainable meals, e.g., by promotions and vouchers as rewards People who bring their own food should also be able to complete challenges and win rewards
7. <i>Not digitally savvy</i> Not everyone is a heavy app user or enjoys using it as a means for learning, whereas the use of the app is central to the learning experience	Create opportunities for reflection and learning outside the app environment, e.g., by providing more informative short displays and activities on site
8. <i>Positive, practical framing</i> A positive framing focusing on the benefits of a sustainable diet as well as practical tips on how to eat sustainably were generally appreciated	Stay positive and provide easy tips on small actions people can take to contribute and tell them how it makes a positive impact

- Implementing toolkits and fostering ownership:* In order to make the implementation of project activities more resilient to external circumstances such as COVID-19 disruptions and the resources of the SU-EATABLE LIFE project team, participating cafeterias and caterers should be the main drivers of the project internally with support from the project team. We will develop an easy-to-use and comprehensive toolkit for stakeholders to adapt and implement the intervention according to their needs and also establish the key elements and commitments required to participate. The staff needs to be fully integrated in the intervention deployment and if possible, in its development. Educating populations about the risks associated with current diets has shown little success to date, and interventions nudging people toward more sustainable choices offer limited scope for lasting change (Guthrie et al., 2015). In contrast to such interventions that are generally “top-down” in nature, approaches in health promotion

TABLE 7.4 Key learnings from Stage I and focus areas for adaptation.

<b>PRIORITIZE REPLICABILITY Create a toolbox and process that can be easily replicated in many cafeterias and are not heavily dependent on the project team and financial resources</b>		
<b>FOSTERING OWNERSHIP</b>	<b>COMMUNICATION STYLE</b>	<b>LEARNING EXPERIENCE</b>
Cafeteria stakeholders share lead and commit resources	Positive, concrete, practical and simple	Positive sensory experiences and fun opportunities for learning
<b>KNOW OUR AUDIENCES</b>	<b>DIGITAL EXPERIENCE (APP)</b>	<b>CAFETERIA EXPERIENCE</b>
Tailored to audiences, time constraints and specific food motivations	Simplified toolbox style and inclusion of meaningful rewards	Inclusive, food-focused, increase tasty options and fit routines
<b>SCIENTIFIC FOUNDATION</b> Theoretical basis for the approach and understanding of the factors, mechanisms and barriers to engagement in sustainable diets		

are characterized by active participation of all actors involved in the change process and aim to empower people to achieve longer-term and wider-reaching behavioral and socioeconomic impact (Tengland, 2012). To facilitate a participatory, cocreation approach within the project, there needs to be dialog, integration, and exchange of views and ideas especially with the chef, kitchen and floor staff. Establishing such a dynamic may allow the staff to become part of the process toward a more sustainable food offering rather than passive observers. This would provide them with a sense of agency but also give the researchers the opportunity to set up intervention activities, which may be more relevant and understandable to them, thus ensuring a potentially more successful intervention and more engaged participants.

- *Increasing flexibility and reducing effort:* Research on intrinsic motivation for long-lasting change warns against putting deadlines and pressure (Steg, 2016). It instead emphasizes the need to provide flexibility and create optimally challenging contexts and opportunities for people to make their own choices. To translate this to the intervention, the experimental time frame will be shortened, and tasks and challenges will be open at all times. This translates into a toolbox-style digital experience, where users can pick and choose according to their interests and learning journey.
- *Know our audiences:* The principles of cocreation will also be applied to cafeteria consumers, increasing their role in the design of activities in order to better understand their time constraints, food motivations, and challenges to tailor content. A buffer of customization regarding the intervention activities will be created by using a toolbox model in which intervention implementers can pick the best-suited activities for their audiences.
- *Communication style, learning experience, cafeteria experience, digital experience:* Everything surrounding the direct and indirect promotion of sustainable diets needs to be done in a positive, fun, practical manner with very actionable tips. Furthermore, activities need to be conducted in a way that is embedded in the preexisting routines of consumers and take delicious food as an entry-way to instilling more sustainable food practices. Food is a prime entry point as eating is the ultimate daily routine that is followed by all and a moment of enjoyment.

Despite the interruption of the intervention due to the COVID-19 pandemic, the intermediate evaluation of project activities provided a number of learnings for the adaptation of the project. Overall, the original learning design was structured around monthly themes/challenges for customers and providing information to catering staff. This did not achieve high levels of engagement or withstand the pressures of time in a fast-paced cafeteria environment. A toolbox approach that provides a range of resources for greater flexibility of implementation and participation was identified as an important factor for the integration of activities into everyday life routines and practices. In addition, there were a number of interesting questions raised regarding people's perception of sustainable food practices and actual behavior, the role of budget, and the importance of social desirability when it comes to sustainable eating. It would be interesting to explore this more deeply in the interviews at the end of a complete run of experiments.

In conclusion, the current events highlighted the importance of prioritizing the replicability of experiments for different settings and the need to create a process and set of resources that can be easily adapted, applied, and validated by participating cafeterias with minimal support from the external project team. These findings have been applied to design and implement the second stage of project activities that started when cafeteria could reopen in October 2021. Four university cafeterias and one business cafeteria in the UK were recruited among members of the Sustainable Restaurant Association. Activities included on-site and online tools for managers, kitchen- and floor staff, university students, and employees that aimed to enable engagement in sustainable diets. The overall outcomes of the project activities can be found at the SU-EATABLE website.<sup>1</sup>

## Acknowledgments

This chapter is based on the efforts of all members of our interdisciplinary project team that consists of social and natural scientists, social media designers, food provisioning intermediaries, communication experts, nutritionists, and dieticians working at Wageningen University (NL), GreenApes (IT), the Sustainable Restaurant Association (UK), and the Barilla Center for Food and Nutrition (IT). The EU SU-EATABLE LIFE project is cofinanced by the European Commission.

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<sup>1</sup> <https://www.sueatablelife.eu/>

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