

Understanding what facilitates interventions with a high potential to address Food Waste Generation across the Food Supply Chain

This newsletter aims to assist stakeholders involved in implementing and researching food waste prevention and reduction interventions by providing guidance on selecting effective actions to achieve their food loss and waste (FLW) goals.

- **Get inspired** and take stock of recent or earlier FLW activities, their approach, focus and location in the CHORIZO [inventory of 395 FLW interventions](#).
- **Prioritise FLW actions** according to different criteria (incl. stakeholders' motivations, abilities or opportunities) in the CHORIZO [FLW index](#).
- **Build upon lessons learned** from the FLW actions relevant to your sector, profile and planned FLW activity by checking out the CHORIZO [sector specific guidance](#).

- 1.primary production
- 2.processing and manufacturing
- 3.retail
- 4.transport and redistribution
- 5.food services
- 6.households
- 7.whole supply chain
- 8.general awareness raising
- 9.municipalities

The underlying research for these outputs was accomplished within the CHORIZO project, studying past and ongoing interventions to tackle FLW throughout the supply chain and identifying factors that enhance the effectiveness of such initiatives.

Approach and methodology

At project start, CHORIZO identified **395 interventions** that address FLW across the EU member states, the United Kingdom, and Norway at the municipal, regional, national, and multi-country levels. These interventions cover **all stages of the supply chain** from primary production to end-user consumption. These interventions have been analysed based on **quantifiable factors** such as funding, economic and environmental impacts. For 46 interventions, the desktop research was complemented by in-depth interviews to better understand, i.e., the social impacts from the actions, how interventions coped with challenges and implementation barriers, and how **motivations** and **social norms** influence FW behaviours. To better understand the driving forces behind behaviours that lead to FW, analysis of the interventions was guided by the **MOA Framework** (explained in a previous newsletter).

Inventory reveals a variety of FLW actions and impacts across sectors

From the 395 actions identified, approximately half of them were actions aimed at the prevention of surplus food (196), when classified in accordance with the **food use hierarchy**.¹

This indicates a predominant pro-active approach, where measures are implemented to prevent food surplus from occurring in the first place, rather than a reactive strategy of managing food waste afterwards. This aligns perfectly with the visual guidance provided by the food use hierarchy. The second most prevalent classification, also in line with the food use hierarchy, was the re-use for human consumption category, with 142 interventions. This underscores the importance of achieving a fair transition towards zero FLW that ensures food security while tackling food waste. While preventing surplus food is the ultimate goal, it's understandable that this isn't always feasible. The inventory illustrates how a **wide range of interventions at the lower levels on the hierarchy** also play **roles in addressing food waste** and should be pursued whenever possible.

Technology and innovation played a prominent role in the identified and analysed interventions, with 100 of them closely linked to technology (such as software, on-line platforms, extending shelf-life via alternate packaging, solutions in the field of temperature monitoring for transport logistics, etc.) or applications ("apps"). Science, technology, and innovation have been particularly evident in the processing and manufacturing sector, where efforts have been made to valorize food waste or by-products from



food processing into new products. Apps have also played a significant role in other stages of the supply chain such as retail, food services, redistribution, and households. These apps have facilitated the redistribution of surplus food, serving as the "middleman", connecting retailers or food service providers with consumers via mobile applications, often offering discounted rates.

In addition to the **environmental benefits** such as the reduction of greenhouse gas emissions resulting from decreased food waste, **the interventions have yielded positive socio-economic impacts**. These include:

1. Job creation, particularly in the circular economy sector, which fosters sustainable practices and resource efficiency.
2. Enhanced knowledge and skill sets among stakeholders involved in implementing and utilizing innovative solutions.
3. Opportunities for innovation and the introduction of new food products, particularly through valorization efforts that transform food waste or by-products into valuable resources.
4. Increased awareness about food waste and its implications for sustainability and resource management.
5. Strengthened community cohesiveness through collaborative efforts to address food waste and promote sustainable practices.
6. Provision of food to those most in need, contributing to food security and social welfare initiatives.

These socio-economic benefits highlight the multifaceted advantages of addressing food waste through technological innovation and strategic interventions across the food supply chain.

¹ European Commission. (2020). *Brief on food waste in the European Union*. Brussels: The European Commission's Knowledge Centre for Bioeconomy (page 8).

https://knowledge4policy.ec.europa.eu/sites/default/files/KCB-Food%20waste%20brief_print_HQ.pdf

Actions' consideration of motivations, social norms, opportunities and abilities to address FLW .

The inventory revealed that social norms have been part of some previous and ongoing FLW interventions. **Injunctive social norms** were very rarely used in the interventions (14 times).



These actions involved either **voluntary agreements**, **legislation** (such as the mandated bio-waste collection for energy production law in France), **rewards** (example of a mobile app in Finland rewarding consumers with credits towards free coffee for reporting still-fresh discounted products in their local stores), or **punishments** (being charged for any leftover food at buffet restaurants for example). Instead, much more often interventions made use of **descriptive social norms**. Most of these actions took place within a

community context, providing a common space to bring people together to eat, connect, learn new skills and reduce food waste. Broader socio-environmental movements were also a common theme in actions driven by descriptive social norms, such as circular economy initiatives. The CHORIZO project will further investigate how injunctive social norms could be used as part of FLW-minimization strategies (e.g., through voluntary agreements, legislation, rewards or punishments).

Four social norms specific to food waste were evident within the list of interventions. These norms were **sub-optimal food/undesirable food quality**, **good provider identity**, **portion size** and **food affluence**, and **associations between food waste behaviour and socio-economic status** (ICF et al. 2018; Stangherlin et al. 2020; Graham-Rowe et al. 2014; Versluis and Papiés, 2016; Zhao et al. 2019; and Middleton et al. 2018). Examples include campaigns aimed at raising awareness about the possibility to still consume not aesthetically pleasing fruits and vegetables (i.e. "suboptimal foods"), or promoting a culture of conscious consumption, thus falling into the "portion size" social norm. However, there was one food-related social norm which appeared more frequently (33 times alone within the retail stage interventions) than the others – that of "suboptimal food/undesirable food quality". **The commercialization of suboptimal food** may be a key mechanism for tackling food waste, with the retail sector perhaps having the most influence in terms of being at the nexus of the relationship between the primary sector (production) and consumers (consumption).



Addressing **abilities to minimize FW** was a **recurrent major strategy** particularly within the food services and households supply chain stages. This comprised improving knowledge, skills, and capacities to change behaviours, such as the capability to plan the purchase of food items, knowing how to prepare food, storing techniques, and being able to assess food safety via labelling. changes in individuals' daily habits.

Particularly in the primary production, redistribution, and retail stages of the supply chain, a lot of the actions have **enhanced opportunities to minimize FW, by improving the availability and accessibility of materials and resources to change FLW behaviours** such as time, technology,



storage equipment, access to stores, and the possibility to purchase affordable and quality food in suitable portions. A common characteristic among these actions was the chance to provide safe surplus food to consumers – whether that be via a food bank, charity organization, non-profit, on-line platform, directly from the farm, or ultimately a retailer, at a free or discounted price.

Recommendations for future FLW interventions across the supply chain.

Based on the assessment of these 395 interventions, the following lessons have emerged for creating an intervention with a high potential for success in addressing FLW.

- **Convert awareness into tangible actions:** All assessed interventions attempted to raise awareness about food waste, which is a necessary first step and vital in providing motivation to address the issue. To **promote behaviour** that effectively addresses food waste, it's crucial to translate awareness into tangible and practical actions that can be integrated into everyday life. To this end, interventions that promote **ability** (knowledge, skills) and/or **opportunities** (resources) are key.
- **Better implementation feasibility:** By pre-identifying and addressing both current and potential **challenges** that might arise during the execution of an action, we can achieve a smoother and faster learning curve, thereby increasing the likelihood of success. In this respect advanced **market research** as well as **cost-benefit analysis** are essential in providing the necessary **data and context** for this purpose
- **Multiple partners:** Collaborating with multiple partners on an intervention, not only strengthens communication and facilitates knowledge-exchange, but also provides access to a wider array of resources. These resources can include financial support, subject matter expertise, technology, equipment, and human **resources**. The project becomes further instilled into society, thereby helping to better ensure its **longevity** over the long-term.
- **Adequate funding:** Closely related to working with multiple partners is the issue of ensuring adequate financial support for an action. Financial resources are always important, but especially for interventions which rely heavily on **technology** (apps, digital platforms) and **equipment** (such as those in the processing and manufacturing sector) or which are **complex, covering various stages** in the supply chain.
- **A multi-pronged approach:** Developing actions that reduce food waste is important, but review of the identified interventions also highlights the importance of addressing other key aspects - such as increased collaboration within a community or attainment of new skills and jobs - to help facilitate **support and longevity** for the action. It is important for the actions to **consider additional objectives** that **will complement and bolster the initiative to reduce food waste**.

• **Monitoring system:** Directly related to the implementation of a multi-pronged approach is the incorporation of a robust monitoring system. It is very difficult to quantify the success of an action without system in place to measure and demonstrate **progress over time** in achieving specific objectives, as well as **complementary positive impacts**. On the one hand, success and positive impacts can be key in garnering **support** for the initiative. On the other hand, monitoring also provides much-needed **insight and knowledge** by highlighting what does and does not need to be addressed to facilitate success, further strengthening the sustainability of the initiative.

• **Incorporating a gender dimension:** None of the interventions identified were specifically geared to incorporate the gender dimension in a systematic way. However, CHORIZO believes that there are dimensions of food waste pertaining to various gender-related social norms, like purchasing and preparation habits, which have therefore not been captured by previous and current initiatives. Incorporating a gender perspective into food waste reduction interventions and respective research can help acquire more fine-grained data which can add to the discussion about how to improve the quality, suitability, and sustainability of the intervention.

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