



# QUANTIFIED ACTIONS TO PREVENT HOUSEHOLD FOOD WASTE

STUDY REPORT  
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# EXECUTIVE SUMMARY



## HOUSEHOLD FOOD WASTE: CAUSES, FIGURES, AND COMPARISONS

Food waste represents very significant economic losses and is the cause of about 8% of the global greenhouse gases emissions. A large part of the generated food waste is avoidable. Households are a major contributor of food waste, caused by e.g. over-purchase, wrong interpretation of the “best before” and “use by” labelling systems, inefficient storage methods, faulty food consumption habits and poor food leftovers management. Food waste generation is different from one household to another depending on their abilities and knowledge to manage and cook food, their motivation to reduce food waste, and contextual factors such as their local food offer or their available time, that can impact positively or negatively food waste generation.

There are quite significant differences when it comes to the generated quantities of “avoidable” food waste by household. Such data were identified for 11 countries and values range from 20 to over 60 kg/cap/yr. Whether these differences are due to inconsistent definitions and reporting methods, or actually reflect discrepancies in consumption and wasting habits across Europe, is unknown. The available data also show differences regarding the type of avoidable food waste generated, possibly indicating that culinary habits have a significant impact on food waste composition. However, most territories report the same food categories in the most wasted products: bread, fruits and vegetables, meat.

FOOD WASTE IS THE CAUSE OF  
**ABOUT 8%**  
OF THE GLOBAL GREENHOUSE  
GASES EMISSIONS.

**HOUSEHOLDS**  
ARE ONE OF THE MAIN SOURCES  
OF FOOD WASTE

IN SOME COUNTRIES, UP TO  
**30 KG / CAPITA / YEAR**  
OF FOOD WASTE  
COULD BE AVOIDED

## MOST WASTED FOOD PRODUCTS



**BREAD**



**MEAT**



**VEGETABLES**



**FRUITS**

## QUANTITATIVE IMPACT OF HOUSEHOLD FOOD WASTE REDUCTION ACTIONS

ACR+ conducted a study for its member Brussels Environment which identified 13 strategies and practices that tackled household food waste and documented the impact on food waste generation. It analysed four national and regional strategies, four operations focusing on food waste measurement, two communication campaigns, two actions addressing food labelling, and one actions in collaboration with smaller food retailers. Very few food waste reduction actions tackling householders managed to properly quantify the impact on food waste generation. Uncertainties regarding the available data also make comparisons and cross-analysis challenging. However, some key findings could be drawn from the cross-analysis of these 13 practices:

### **SUCCESSFUL FOOD WASTE REDUCTION STRATEGIES RELY ON A MIX BETWEEN RECURRING, MASSIVE CAMPAIGNS AND SMALLER ACTIONS CONVEYING SIMPLE AND CLEAR MESSAGES AND TARGETING SPECIFIC POPULATIONS.**

Such strategies also rely on the collaboration with different stakeholders, and continuous monitoring of the impact on prevention behaviour and waste reduction.

### **IMPROVING THE INFORMATION ON FOOD LABELS, SUCH AS USE-BY OR BEST-BEFORE DATES, OR INDICATION ON OPTIMAL STORAGE, HAS THE POTENTIAL TO REDUCE FOOD WASTE BY 10 TO 15%.**

### **FOOD WASTE MEASUREMENT OPERATIONS ALSO RAISE AWARENESS.**

Food waste measurement operations, in which households are invited to measure their food waste generation before and after implementing specific measures, tend to lead to very significant decrease of food waste generation, ranging from -30 to -60% over short periods of time.

### **INTENSIVE COMMUNICATION CAMPAIGNS CAN LEAD TO RELEVANT RESULTS.**

Communication must present concrete actions as well as meaningful reasons for households to engage in food waste prevention, which requires to tailor the messages to key target audiences.

Furthermore, about 20 publications addressing household food waste prevention were reviewed, and key recommendations were also identified. The lessons learnt from the documented practices and from these publications lead to the identification of general recommendations:

- Promote self-assessment of individual food waste generation
- Inform, raise awareness, promote preventive actions
- Collaborate to improve the information on food products
- Determine your resources, objectives, and monitoring

## PROMOTE SELF-ASSESSMENT OF INDIVIDUAL FOOD WASTE GENERATION

The discrepancy between people’s perception of their own food wastage and the actual wasted quantities makes it relevant to attract their attention on their individual behaviours. Self-assessment practices tend to give very good results when it comes to food waste reduction and seem to provide a significant potential to lead households to concrete actions. However, most of the identified actions focus on rather small panels of participants and requires intensive human resources to properly monitor their involvement.

SUGGESTED ACTIONS

### IDENTIFY SYNERGIES WITH FOOD WASTE SORTING

Food waste sorting can compete with the food waste message, or conversely, can raise awareness or even equip households to reduce their food waste. There is no evidence that food waste sorting leads to either increase or decrease of food waste generation. If food waste collection is being implemented, it can be relevant to also attract attention on food wastage before and after the implementation, while focusing the communication solely on sorting during the first months of implementation.

### DEVELOP REGULAR PRACTICAL AWARENESS RAISING CAMPAIGNS THROUGH SCHOOLS

Implementing actions promoting weighing of food waste could also have a relevant potential to raise awareness on food waste.

### CAPITALIZE ON FOOD WASTE MEASUREMENT ACTIONS TO MAKE WASTE REDUCTION A SOCIAL NORM

Various publications indicate that making food waste prevention a social norm is one of the most promising ways to promote the implementation of sustainable household actions. Capitalising on the experience of participants in food waste measurement operations seems to have a potential, preferably during “live” social events (in the context of neighbourhood associations, sports, cultural events, etc. to which the participants may be affiliated with). Engaging local “influential” personalities that could reach different types of target audience in such practices could also be interesting.

### DEVELOP SELF-ASSESSMENT TOOLS AND PROMOTE THE ADOPTION OF PREVENTION BEHAVIOURS BY HOUSEHOLDS

For actions of self-assessment of food waste generation to reach larger panels of participants, it is interesting to explore ways to allow households to conduct such a process independently. As an illustration, the 2022 edition of the “Food Winners Brugge” initiative involves more than 5,000 participants, by capitalising on the previous editions to produce communication and training materials, and by involving local companies, associations, and schools. Besides, identifying the socio-demographic characteristics of the participants to such activities could help spot and target under-represented audiences. Assessing the long-term effects of such initiatives with surveys occurring 1 year after the organisation could also help to determine the full potential of these self-assessment practices.

### CONSIDER DIFFERENT INSTRUMENTS AND MESSAGES

To reach a wider audience, food-related prizes could be proposed to participants in self-assessment practices. Besides, different messages should be used to promote such practices, such as the potential financial savings (150 to 200€ per household per year) or the time saved thanks to a better management of food at home.



## INFORM, RAISE AWARENESS, PROMOTE PREVENTIVE ACTIONS

Communication is the main instrument currently used for the promotion of food waste prevention. Even though other (economic) instruments could be investigated, local food waste prevention policies should rely on a regular, pro-active, and targeted communication to raise awareness of householders on the negative impact of food waste and on the practical prevention behaviours, as well as to engage the different stakeholders and make their commitment visible. Several recommendations are suggested:

### MAKE FOOD WASTE A RECURRENT COMMUNICATION THEME

Successful communication campaigns make the key messages visible, easily identified, and displayed in all relevant communication channels (general media, public space, food retailers, etc.). To do so, they resort to recurrent communication actions and to a strong visual identity also used by external partners. Homogenising the messages, the visual identity, and seeking consistency among the different initiatives against food waste implemented by the different local players are recommended and is facilitated by the setting a local/regional communication committee that brings together the key players e.g. retailers, food chains and restaurant owners, and associations active on food.

### ORGANISE AN ANNUAL HIGHLIGHT

A thematic day or week focusing on food waste prevention is an effective way to attract the attention of households on the challenges of food waste generation and the need for prevention. This is also a way to mobilise all key local stakeholders and highlight their commitment in the prevention strategy, and to reach the general media.

### IMPLEMENT SPECIFIC COMMUNICATION ACTIONS TO TARGET DIFFERENT AUDIENCES

Smaller actions, focusing on one or two key messages or prevention practices, targeting a specific and well-identified target audience, are essential to address more specific challenges, through the use of tailored messages and adequate communication channels.

### TRAINING IN PREVENTION BEHAVIOURS

Zero waste cooking workshops are often a key activity to directly engage with households and teach the concrete practices to limit food waste. However, they tend to mainly attract households with an initial interest in zero-waste. In order to reach a wider audience outside of interested households, it is recommended to train people offering training that could indirectly relate to food waste such as cooking teachers, home organising coaches, and parental coaching.

### DELIVERING "THE RIGHT INFORMATION" TO THE "RIGHT PLACE"

Displaying clear and concrete indications where householders are in capacity of acting is an effective way to create nudges. This can be materialised by information on durability or storing advice in stores, by magnets explaining how to manage one's refrigerator, or by trays where householders can put leftover or opened products so that they can identify the food to be used in priority in their fridge.

### LINK FOOD WASTE PREVENTION WITH THE LOCAL FOOD STRATEGY

The prevention message is more effective when it is integrated into global strategies on food (e.g. promoting local and sustainable food), rather than in waste prevention and waste reduction strategies. Besides, it seems that the local food production and local food distribution/offer have a strong impact on food waste generation. These relations should be further investigated





## COLLABORATE TO IMPROVE THE INFORMATION ON FOOD PRODUCTS.

Expiration dates or information on proper storing practices presented on packaging strongly impact household food waste generation, both in positive or negative way. Misuse of “use-by” and “best before” dates, or misinterpretation of these dates by consumers all lead to avoidable food waste generation. Improving these aspects has the potential to lead to a reduction of food waste by 10 to 15%.

# SUGGESTED ACTIONS

### BRINGING TOGETHER STAKEHOLDERS

Improving food labelling requires the involvement of key stakeholders, such as federations of producers/distributors, as well as health authorities to ensure that the proposed changes are aligned with food safety regulation.

### ESTABLISH GUIDES ON BETTER FOOD LABELLING

Recommendations can be highlighted in practical guides addressed to food producers and retailers, clarifying definitions and obligations, listing advice for storage information and for presenting key indications. These guides can also present figures on food waste generation linked with misuse of food labelling. Such guides can be general or targeting more specific food products. They must be prepared in collaboration with the stakeholders mentioned above, to make sure that the recommendations are aligned with the constraints and possibilities of food producers and distributors, and with the safety regulation. Such a collaboration is also essential to ensure a proper dissemination.

### ORGANISE PILOT ACTIONS WITH RETAILERS

It is recommended to organise testing phases in several shops focusing on specific actions: change of formulation and format for use-by and best-before labelling, improved recommendations on storage, new logos, etc. Such testing phase should aim to assess consumers' reactions to these changes and identify if it actually leads to concrete change of behaviours.

### PROMOTE INTER-REGIONAL COOPERATION

Joining force with other regions or with national authorities is recommended, to ensure consistencies and to better involve major food producers. Having consistent food labels is essential to avoid confusions on use-by and best-before dates. Information and recommendations on food storage should also be presented in a homogeneous way to avoid confusions.

## DETERMINE YOUR RESOURCES, OBJECTIVES, AND MONITORING.

More general recommendations can be formulated when it comes to food waste strategies.

# SUGGESTED ACTIONS

### ALLOCATE SUFFICIENT AND CONTINUOUS RESOURCES TO FOOD WASTE PREVENTION

The strategies or specific actions that managed to achieve significant results on a large scale generally allocated significant human and financial resources, with amounts ranging from 0.10 to 0.20 € per person. To obtain durable results, programmes should be given a continuous attention and include recurring and consistent activities, as isolated actions tend to give short-lasting effects. Cooperation with other regions and local stakeholders must be sought to optimise the use of resources.

### SET QUANTITATIVE TARGETS

Quantitative targets are a strong driver for the implementation of ambitious strategies and of an adequate monitoring system. It is still challenging to propose quantitative targets that are based on actual data; for such targets should take into consideration the current level of avoidable food waste as a starting point. As an illustration, the Love Food Hate Waste campaign in the United Kingdom managed to achieve a 30% reduction of avoidable food waste over a decade.

### ASSIST LOCAL STAKEHOLDERS IN UNDERTAKING IMPACT ASSESSMENT

Providing tools and methods for local stakeholders implementing food waste prevention activities to help them monitor the impact of their actions is a good way to better understand the impact of the different instruments in use, and to assess the effectiveness of individual actions. It also contributes to make monitoring data more consistent.

### ESTABLISH A PROPER MONITORING SYSTEM

Regular surveys are a good way to assess the adoption of food waste prevention behaviours by inhabitants, the trends regarding food consumptions, or the reaction to the strategy or specific actions. Quantifying the evolution of avoidable food waste via composition analysis or panels of citizens is also strongly recommended. The evolution of food waste generation should be interpreted in parallel with the changes of behaviours, but also with “external” parameters such as the evolution of the cost of food.

### MONITOR THE IMPACT OF INDIVIDUAL ACTIONS

When implementing specific actions (communication campaigns, awareness raising in schools, measurement campaigns, etc.), it is important that the monitoring system put in place does not only monitor the activities and the outreach of the actions implemented but also the impact of the different actions on food waste prevention behaviours. Ensuring consistency when it comes to the monitoring of individual actions also contributes to harmonise their assessment and aggregate results, e.g. by defining a common typology of food waste behaviours that can be used by the different action developers.





PART 1

# HOUSEHOLD FOOD WASTE PREVENTION



## CONTEXT

Food waste is a major challenge in Europe and globally. Every year, about 88 million tonnes of food waste are generated in Europe, representing a cost of 143 billion euros<sup>1</sup>. Food losses and food waste<sup>2</sup> occur at every step of the food value chain, yet a large part of the wastage is generated by households<sup>3</sup>. The Food and Agriculture Organisation assessed that one third of all food produced in the world is lost, generating about 8% of total anthropogenic GHG emissions<sup>4</sup>. ACR+ also identified food waste as one of the most carbon-intensive municipal waste fractions as a result of its *More Circularity, Less Carbon* (MCLC) campaign<sup>5</sup>, with most of the impacts associated with the production processes. The following graphs show the contribution of food waste regarding the carbon footprint of municipal waste, including the impact waste management, but also of the extraction of resources and production processes of the products that became waste.

Every year in Europe  
**88 MILLION TONNES**  
of food waste are generated  
reaching a cost of **143 BILLION €**

**1/3 OF ALL FOOD**  
produced in the world  
**IS LOST** generating about  
of total anthropogenic GHG emissions **8%**

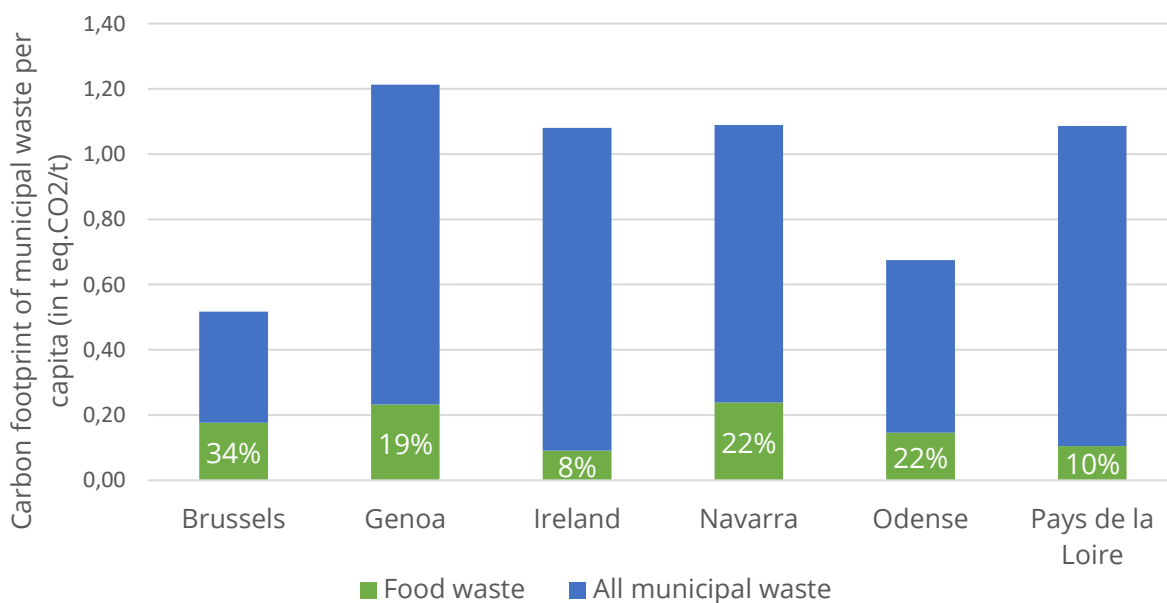


Figure 1: Carbon footprint of food waste compared to total carbon emissions from municipal waste (Source: *More Circularity Less Carbon Campaign, 2018-2020 evaluation*)

<sup>1</sup> FUSIONS, 2016

<sup>2</sup> UNEP defines "food loss" as food that gets lost during its process before it reached its final product stage, and "food waste" as food transformed into a final edible product but discarded and not consumed.

<sup>3</sup> FUSIONS, 2016

<sup>4</sup> FAO, 2011

<sup>5</sup> <https://www.acrplus.org/en/morecircularitylesscarbon>



The results of the two first cohorts of the MCLC campaign presented in Figure 1 show how reducing food waste generation would have a considerable impact in terms of curbing carbon emissions, impacting positively on CO<sub>2</sub> emission reduction up to 15% in certain areas. Food waste prevention is hence of great importance, especially in view of the upcoming food waste reduction targets that the EC aims to set by 2023. However, little evidence is currently available on how to significantly reduce household food waste from a practical point of view. Despite the many different initiatives implemented across the world to raise awareness and promote prevention behaviours, the actual reduction of households' food waste still remains a challenge for many cities and regions in Europe. While many territories have assessed the generation of food waste and identified some of the main causes behind them, few have monitored the evolution of food waste and the impact of their prevention strategies.

This report aims to present practices and strategies for which food waste reduction was monitored and documented, and to suggest recommendations on how local and regional authorities can promote household food waste reduction practices.

## SCOPE OF THE STUDY

This report presents good practices focusing on household food waste prevention for which quantitative data are available regarding avoided quantities. It also lists the main messages and key recommendations identified in the literature, in local, regional, and national food waste prevention strategies, and in past and on-going European projects and initiatives.

The study focuses on food waste produced by households, mainly at home, but also out of home. Actions targeting food donation, as well as actions aiming to better measure and understand household food waste are not included.

This report is based on a study commissioned to ACR+ by Brussels Environment, the environment and energy agency in the Brussels Capital Region (Belgium). The study aimed to propose an action plan for the update of the regional food waste prevention strategies, in preparation of target intervention action part of the upcoming [“Good Food 2.0” strategies](#).

## PRACTICAL CASE

Good Food 2.0 is the second version of Brussels' Good Food strategy, aiming at the promotion of a more sustainable food system in the Region. The strategy has two main goals: “produce better” and “eat better”, this by promoting local food production, developing healthier and more sustainable food supplies, and by reducing overall food waste.

Good Food 2.0 is currently being co-elaborated with key regional stakeholders, based on the assessment of the first strategy led between 2016 and 2020.

### GOOD FOOD 2.0: Toward a sustainable food system in the Brussels Capital Region

In the first strategy, food waste prevention was promoted through a number of initiatives, which included the development of practical information and tools to help household reduce their waste, and the inclusion of food waste reduction training in dedicated food classes targeting school pupils, students, and citizens.

These different actions led to a reduction of 25% of food waste in the period 2016-2019, which was below the 40% target initially set by the strategy.

## DEFINITIONS

The available publications tend to use the terms “food waste” and “food loss” in different manners. The FUSIONS project defined food waste as “any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed”, which includes both discarded food and food products that could have been eaten, and inedible parts (such as bones). It also includes liquid food waste. FAO makes a distinction between food losses, which occurs in the food supply chain, and food waste, which is generated by retailers and consumers.

A distinction is commonly made between “avoidable” or “edible” food waste (food waste that could have been eaten by human and was not because of various reasons, including expired food, damaged food, leftovers that were not eaten), and “unavoidable” or “inedible” food waste (such as bones, skin, etc.). The exact definition of avoidable and unavoidable food waste might vary from one territory to another, and some publications also use the term “potentially avoidable food waste” for fractions that are commonly not eaten but could be (such as peelings, offal, and leaves). This leads to uncertainties when it comes to data comparisons.

This report focuses on avoidable food waste, with data being presented referring to food that is lost but which could otherwise be eaten. It has to be noted however that there is generally no information on the exact definition and on what is included of “avoidable food waste” within the existing literature. Whenever quantitative data is presented, details will be given on what it covers whenever possible.

**FOOD WASTE :**  
*“Any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed”*

## FOOD WASTE: GENERAL CONSIDERATION

**Even though food losses and waste occur at EVERY STEP OF THE FOOD VALUE CHAIN, 50% of the wastage IS GENERATED BY HOUSEHOLDS**

Based on the available data, European households represent the main source of food waste, generating about 50% of the total share produced along the FVC<sup>6</sup>. Household avoidable food waste manifests itself in different ways: over-purchase of food items and subsequent disposal of expired products, wrong interpretation of the “best before” and “use by” labelling systems, and consequent erroneous food handling, inefficient storage methods, imperfect food consumption habits and food leftovers management. The reasons behind food waste are many: poor planning of meals, not cooking the right portions, unforeseen events disrupting the meals planned, etc.

<sup>6</sup> FUSIONS, 2016



Food waste reduction can be achieved through a combination of different interventions:

- **Raising further awareness among households through different channels.** Households may be aware of the problems associated with food waste, but may not be aware of their own waste generation, of the causes behind it, or of solutions to prevent it;
- **Promoting the adoption of practical prevention behaviours linked to:**
  - Purchasing: meal and groceries planification, purchase of the right quantities, etc.
  - Use: sharing of food with neighbours and use of local food sharing facilities
  - Food storage and stock management: respect of the cold chain, tying up and cleaning frequently the fridge, freezing food, follow up of expiration dates, knowledge of use-by and best-before dates, etc.
  - Meal preparation: adaptation of quantities, accompanying leftovers, etc.
  - Leftovers management: reuse of leftovers
- **Understanding the motivation of citizens and highlighting their interest in reducing waste:** environmental or ethical issue, value of food, potential savings, etc.

Other instruments are currently being tested, such as fiscal measures to prevent food waste. For instance, Pay-as-you-throw systems are intended to be applied to food waste generated by the HoReCa sector within the framework of the FOODRUS project<sup>7</sup>. Taking into consideration the proved effectiveness of such measures when it comes to source separation of waste, it could be interesting to apply them to food waste prevention.

Behavioural changes are difficult to initiate, and households may have some specific constraints (time, space, resources, knowledge) or personal oppositions (preconceived ideas, conflicting values, etc.). One of the challenges is that constraints and oppositions are different from one household to another, and that messages need to be adapted to the specific target audiences.

Promoting food waste reduction goes through a wide variety of actions: general information and communication campaigns, distribution of “anti-food waste” tools (measuring glasses, etc.), trainings and workshops, adaptation of packaging and labels, etc. Although food waste prevention strategies are often coordinated by public authorities, the activities can be implemented by a variety of different actors, from local associations to food stores, from schools to consumers’ groups.

## EUROPEAN COMPARISON

Many territories conducted analyses to assess the quantities of avoidable food waste generated. Such studies employ different quantification methods such as panels of households sorting and weighing food waste, or composition analysis of residual waste and of selectively collected food waste.

The following map summarizes the results of several household food waste quantification studies carried out in different countries. Reference is here made to the avoidable food waste fraction. In the table, we also report a short description of the quantification method. Differences in the methodological approach used for the evaluation, undoubtedly lead to some degree of bias for the quantitative comparisons.

<sup>7</sup> <https://www.foodrus.eu/>

## AVOIDABLE FOOD WASTE FIGURES ACROSS COUNTRIES

### CANADA · 36 KG/ CAP/YR.

Household food waste characteristics (2017)  
Source : LFHW Canada, 2018

### UNITED KINGDOM · 67 KG/ CAP/YR.

Composition analysis of all household waste streams (2018)  
Source : WRAP (2020), UK progress against Courtauld 2025 targets and UN Sustainable Development Goal 12.3

### LUXEMBOURG · 23.5KG/ CAP/YR.

Composition analysis of household waste (2019)  
Source : Government of the Grand Duchy of Luxembourg (2020), Summary of the 2018/2019 study on the generation, treatment and prevention of food waste in the Grand Duchy of Luxembourg

### FRANCE · 30 KG/ CAP/YR.

Quantities identified via the 2017 national characterizations in residual waste and sorted bio-waste (fields: household and similar waste)  
Source : ADEME, MODECOM 2017

### SPAIN · 30.2 KG/ CAP/YR.

Panel of 4,000 households reports twice a year all their avoidable food waste over a week (2020)  
Source : Alimentosdespana (2021), Desperdicio dealimentos de los hogares en españa - año 2020 vs 2019



### FINLAND · 23 KG/ CAP/YR.

Measurements made by a panel of 380 households (14 days, in 2013)  
Source : K. Silvennoinen et al. (2014), Food waste volume and composition in Finnish households

### DENMARK · 46.3 KG/CAP/YR.

Composition analysis of residual waste in different typologies of housing (2014)  
Source : Miljoministeriet (2014), Kortlægning af dagrenovation i Danmark

### THE NETHERLANDS · 34.3 KG/ CAP/YR\*

\*of which 26.5 kg/ cap/yr. thrown with waste, and 7.8 kg/ cap/yr. elsewhere (sink, compost, animals...)  
Waste characterization, monitoring of individual non-waste waste (2019)  
Source : Voedingscentrum, 2020, Synthesis report on Food Waste in Dutch Households in 2019

### GERMANY · 32.9 KG/CAP/YR.

Composition analysis of household waste (2015)  
Source : Thünen (2019), Food waste in Germany – Baseline 2015 – Summary Thünen Report 71

### BRUSSELS REGION · 19 KG/ CAP/YR.

Composition analysis of residual waste (scope: household waste)  
Source : Data by Brussels Environment

### AUSTRIA · 26 KG/CAP/YR.

Composition analysis of residual waste from households (2021)  
Source : Federal Ministry of Austria Sustainability and Tourism (2019)

### GREECE · 26 KG/CAP/YR.

Measurements made by a panel of 101 households (14 days, in 2017)  
Source : K. Abeliotis et al. (2017), Food waste volume and composition in households in Greece



It should be noted that all data on “avoidable food waste” are assessment, either based on individual measurements performed by households, or on composition analysis of waste (e.g. residual waste and food waste). Even though panels are supposed to be representative, and composition analyses are generally performed according to standardised methods aiming to limit uncertainties, it is challenging to assess the reliability of the data. For methods resorting to measurements by households, differences can be observed when it comes to the size of the panel, the duration and seasonality of the measurement, and the control systems to avoid inconsistencies. To put it short, data may not be completely comparable as:

- **The assessment methods are different:** survey on a inhabitants panel, waste composition analysis including different waste fractions (residual waste, biowaste, other fraction), inclusion or not of home composting, etc.
- **The scope may be different:** certain studies focus only on households, other potentially include assimilated waste, meaning non-household (e.g. commercial) waste managed together with household waste.
- **“Food waste” definitions may vary from one place to the other:** what is considered as “edible” and “not edible” is not explicitly described in the reports.
- **Some specific fractions might be excluded:** for instance, liquid food waste being thrown in the drain is probably only included when the assessments are performed by households while is being overlooked in composition analysis.

It is **CHALLENGING** to identify whether the **OBSERVED DIFFERENCES** come from **HETEROGENEOUS DEFINITIONS & SCOPES** differences in **CONSUMPTION PATTERNS** or the **EFFECTIVENESS OF FOOD WASTE PREVENTION STRATEGIES**

Therefore, it is challenging to identify whether the observed differences come from heterogeneous definitions and scopes, differences in consumption patterns, or the effectiveness of food waste prevention strategies. It seems complicated to assess the effectiveness of strategies based on the “avoidable food waste quantities” indicator; such assessment should rely on the monitoring of food waste generation overtime. However, efforts to establish consistent comparisons of food losses and waste should be pursued, as a way to better identify successful strategies and their impact on food waste quantities.

The difficulty to compare territorial or national data is confirmed when comparing the share of avoidable food waste in household or municipal food waste, as presented in Figure 2 which depicts the input data presented in the [map page 13](#). Both total quantities per capita are quite different from one territory to another (which might be due to different scope, e.g. sometimes including “assimilated” food waste from non-household waste producers, or due to differences in consumption patterns. The share of avoidable food waste is also quite different, which might reflect different definitions, different measurement system, or different behaviours when it comes to food waste prevention.

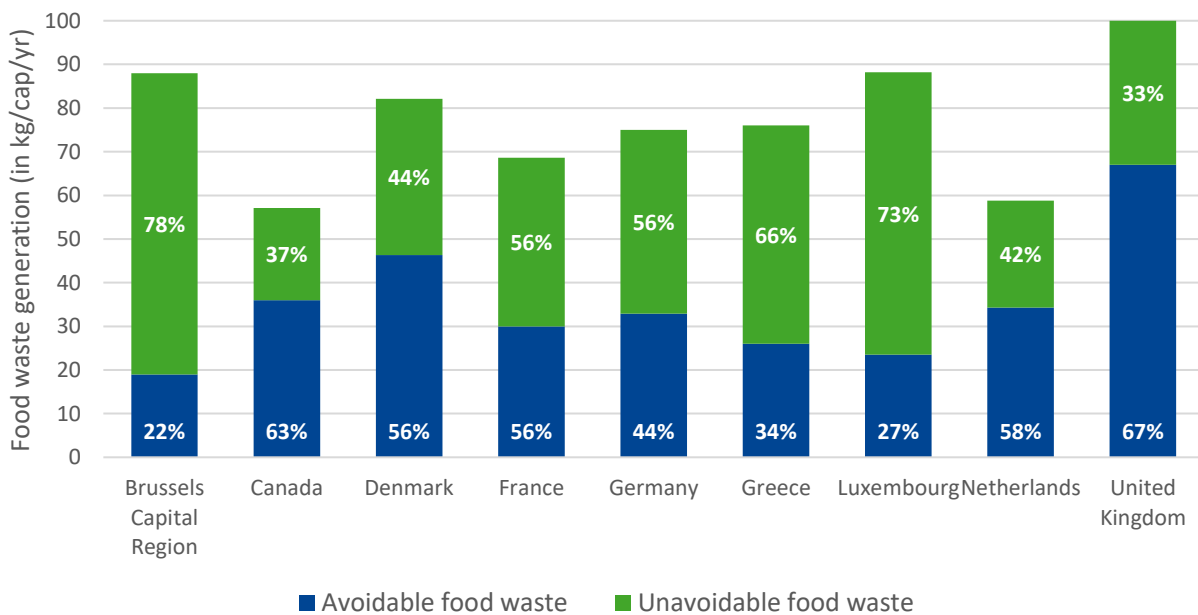


Figure 2: Quantities of avoidable and unavoidable food waste per capita (in kg/cap/yr)

Other comparisons can be done with the data collected by the European project REFRESH, which quantified food waste in several European countries<sup>8</sup>. The three used categories used in the REFRESH project to quantify avoidable food waste (not used products, partially used products, leftovers, including leftovers stored before disposal) are relatively close to those used for the computation of avoidable food waste in the Brussels Capital Region (BCR), presented in the [map page 13](#). These figures are presented in the following graph:

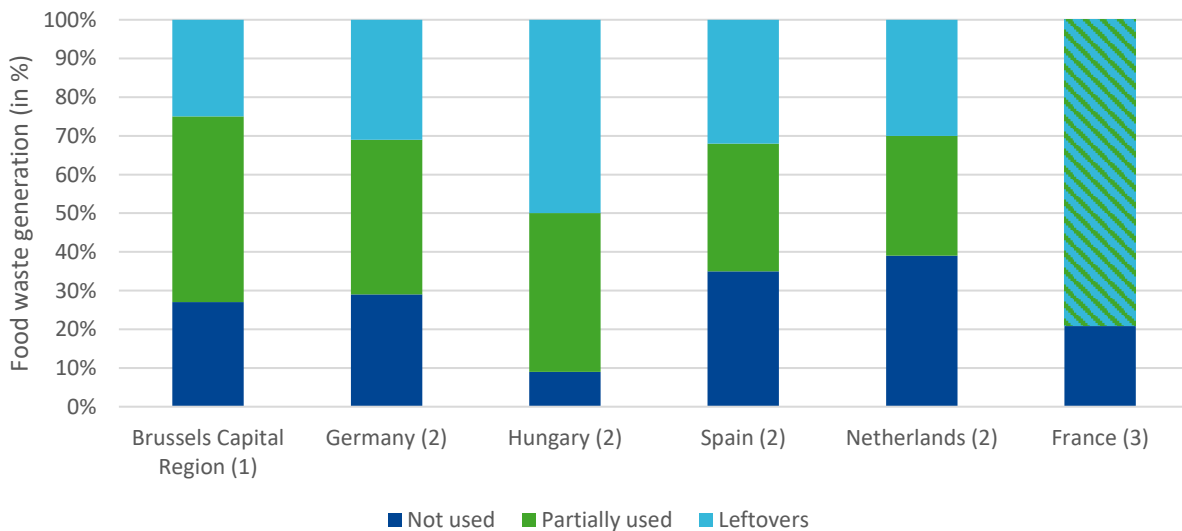


Figure 3: distribution of wasted quantities of avoidable food waste by source of waste in different countries (sources: (1) E. Taupinart (2015), (2) Refresh (2016), (3) ADEME (2021))

<sup>8</sup> REFRESH (2017), Quantified consumer insights on food waste - Pan-European research for quantified consumer food waste understanding



There are some differences on the “profile” of avoidable food waste, with more leftovers being thrown away in Hungary, predominant arising of “partially used” food in the Brussels Capital Region and Germany, and proportionally more unused food wasted in Spain and the Netherlands. According to the Refresh Project, the fact that unused or partially used food is predominant in many countries is linked with the fact that for the most part, the wasted food is perishable products in most countries: bread, fresh fruits and fresh vegetables, dairy products, and meat. The exception of Hungary is attributed to the fact that soup prepared from fresh vegetables is more disposed of than fresh vegetables, showing the potential importance of local culinary habits in the profile of food wastage.

## MOST WASTED FOOD PRODUCTS



Most territories have the same food categories in the most wasted waste: bread, fruits and vegetables, meat. This is confirmed by other studies, such as the one conducted by the Joint Research Centre in 2019, as shown in the following figure:

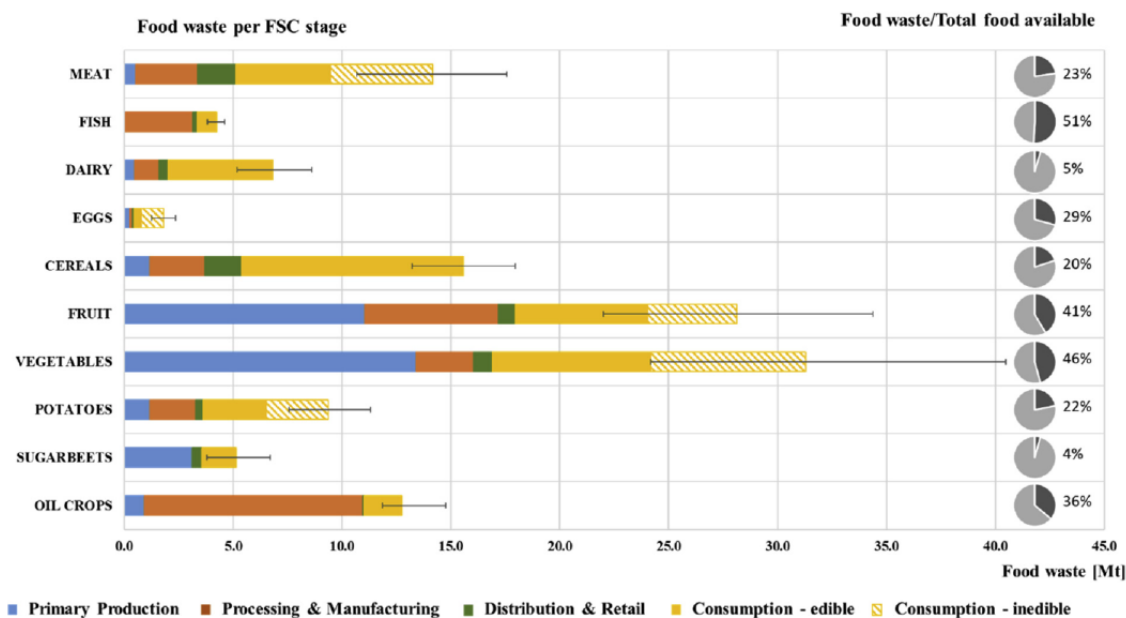


Figure 4: Distribution of food waste by food category and by food supply chain stage, in Europe (Source: Caldeira et al., June 2019)

## FACTORS IMPACTING FOOD WASTE GENERATION

When documenting good practices in food waste prevention, it is important to describe the context where these practices are successful. Indeed, good practices are generally adapted to a specific context, for instance targeting a certain population, with specific food purchasing and consumption patterns, or a specific, typology of housing (which might influence the possibility to store food or cook in a proper way). Understanding the specific context is important before considering the transfer of good practices to other territories or household groups. A successful practice might not be adopted in another context, where the target population and, the key drivers behind food waste prevention are different, or where specific positive factors (such as the presence of local NGO active on food waste) might be unavailable.

To estimate the transferability of good practices for food waste prevention, it is hence necessary to list the different factors that influence food waste generation on one hand, and the socio-economic and behavioural context where this food waste generation is being produced.

In this report, various eight studies investigating the subject have been consulted (full list available in the annexes). The general conclusion is that socio-demographic parameters have a limited impact compared to other factors (household attitudes, values, or other psychological variables).

The following parameters seem to be significantly correlated to food waste:

| AGE  | EMPLOYMENT   | HOUSEHOLD COMPOSITION  |
|--|--|--|
| Young people seem to waste more than older people, who know and apply better good practices. | Full time employees tend to waste more than unemployed people. | The presence of children in the household seems to generate more contingencies and more waste. |

A number of other parameters have been also identified, but with more nuanced impacts:

- **Size of the household:** bigger households seem to generate more waste, linked to a more complicated food management at home, and to more complex meal planification. However, certain studies show also problems linked to the food offer for smaller households, especially single households, which may find difficult to find adapted portions.
- **Gender:** it seems that women are more aware of the negative impact of food waste, and that they have higher sensibility as compared to men regarding food waste. Analysed studies however do not show any correlation between gender and behaviours linked to food waste.
- **Income levels:** it seems that households with different levels of incomes have different food waste profiles (less storage problems for high income earners, but more tendency to eat out which may induce waste at home). No common trend could be identified regarding the link between household incomes and food waste generation.
- **City size and typology (urban or rural):** different observations could be identified depending on the countries and studies.

International comparisons also show similarities and differences in the nature of waste and which foods are thrown away the most.

More generally, it appears that socio-demographic factors do influence different drivers that impact households' behaviour towards food and the degree of generation of food waste. In this respect, the European project REFRESH identified the drivers determining the extent to which households generate food waste as shown in Figure 5.:



Figure 5: Model of food waste by consumers (Source: REFRESH project, 2017)

According to the REFRESH project, there are 4 main interacting forces that determine food waste generation for households. These are:

- **The motivation** behind the implementation of actions. Two points were particularly identified: the negative perception of food waste by the household, and the perception of food waste generated by peers (family, friends, neighbours). If relatives waste food, the household will regard food waste as acceptable, and will be less likely to act for its reduction.
- **Food skills** ("Abilities"): creativity in cooking, reuse of leftovers, ability to plan meals, knowledge of food storage and shelf life, or use-by dates.
- **Events/contextual elements** ("opportunity"): these include unforeseen events, the food supply in nearby stores (food quality/sustainability, opportunities for appropriate portions, etc.).
- **Other factors** competing with food waste ("Competing goals"): the importance of taste, the fear of running out of food, the importance given to the price of food products...

Therefore, if local specificities generally play a role on the potential performances of specific good practices, it seems that food waste generation mostly depends on individual contexts, behaviours, or motivations, which might be connected with specific profile. Young parents for example might have less time to devote to properly plan shopping lists or meals, while youth might have lower abilities when it comes to planning the right quantities, storing food, or cooking leftovers. This means that prevention activities and messages must be tailored to specific target groups.





PART 2

# QUANTITATIVE IMPACT OF FOOD WASTE PREVENTION PRACTICES



## METHOD

One of the objectives of this study is to identify good practices for which the impact on (avoidable) food waste production has been measured. To do so, a bibliographical analysis has been carried out on the basis of several identified studies, recent European projects on the subject (e.g. [Refresh](#), [Trifocal](#)), national projects and strategies (i.e. [Love Food Hate Waste](#) in the United Kingdom, [FOODWIN](#) in the Netherlands, [Más alimento, menos desperdicio](#) in Spain, [Anti-Gaspi](#) in Luxembourg, [Zu gut für die Tonne](#) in Germany, [Stop spild af mad](#) in Denmark). Research has been carried out to identify other benchmarks on the potential of reduction linked to specific actions, but few elements could be identified. For example, the Joint Research Centre (JRC) report on the evaluation of waste preventive actions<sup>9</sup> lists several actions aiming at household food waste, but very few quantified data on their real impact. However, current initiatives seem to address the issue, like the "European Consumer Food Forum"<sup>10</sup> initiated by the JRC.

The identified good practices have been categorised, enabling comparisons by type of action or type of instrument. Cross-analyses have been undertaken to identify similarities and differences, and to identify key recommendations. Recommendations identified in the various reports and projects consulted in the framework of the study have also been listed and compared.

All the bibliographical sources used can be consulted in the bibliography of this report.

## OVERVIEW OF IDENTIFIED PRACTICES

**13 PRACTICES**  
were identified in  
**7 COUNTRIES**

SPAIN · UNITED STATES · FRANCE ·  
JAPAN · LUXEMBOURG · NORWAY ·  
UNITED KINGDOM

**4** National or regional strategies

**2** Communication campaigns

**4** "Food waste measurement" operations

**2** Actions on food labelling

**1** Awareness campaign targeting small businesses

In total, 13 practices with results in terms of avoided quantities of food waste were identified across 7 countries: Spain, United States, France, Japan, Luxembourg, Norway, and the United Kingdom. Other actions that have been identified are not included here as they were implemented on very small scales, or because they resulted redundant with others.

The selected actions have been classified in the following categories:

- **National or regional strategies (4 practices):** these strategies include different types of actions targeting households among others (communication campaigns, distribution-related actions, training workshops, etc.), and are generally monitored "globally", meaning that the different activities organised within the strategies are generally not monitored

<sup>9</sup> JRC (2019), *Assessment of waste prevention actions - Development of an evaluation framework to assess the performance of food waste prevention actions*

<sup>10</sup>[https://knowledge4policy.ec.europa.eu/projects-activities/european-consumer-food-waste-forum\\_en](https://knowledge4policy.ec.europa.eu/projects-activities/european-consumer-food-waste-forum_en)

individually. However, few campaigns have been able to estimate the reductions in food waste related to the running of the campaign itself, and the reductions in relation with the context (food prices, household income, etc.).

- **“Food waste measurement” operations (4 practices):** the various participating households of these operations weighted their food waste, implemented actions, and measured changes. These different actions explored different approaches (e.g. specific target audiences, comparisons of different approaches, tests of different practices.).
- **Communication campaigns (2 practices):** the campaigns evaluated their impact by measuring waste levels before and after the campaign. These campaigns mixed "general communication" actions (i.e. billboard advertising, online communication) with more "direct communication" actions (e.g. cooking workshops, stands).
- **Actions on food labelling (2 practices):** these actions, carried out in collaboration with food producers and distributors, as well as health authorities, have sought to improve the information presented on products' labels (i.e. use-by date, conservation advice), with the aim of reducing waste in consumers' homes.
- **Awareness campaign targeting small businesses (1 practice):** this action proposed diagnoses and training of small businesses for the implementation of actions aiming, among other things, to reduce waste at consumers' premises.

These different actions have measured or assessed their impact by different methods: waste composition analysis (of participants, or of a representative sample of the population) implemented as part of the actions, or as part of the general monitoring of municipal waste composition, or individual weighing of participants who were provided with scales. However, it should be noted that the figures identified are not always comparable, and benchmarking should be considered with caution:

- **The scope of waste** considered is different from one action to the other: certain actions measure total food waste, avoidable or not, whereas other only target the avoidable/edible part. However, it is quite rare to have the information on the exact scope of waste included (taking into account liquids, definition of “avoidable waste”, etc.).
- **The scope of waste measurement:** some actions measure the waste of a global population (e.g. by carrying out a characterization of a representative panel of the population, regardless of their implementation of prevention behaviours), while others focus on the quantities wasted by people implementing actions (e.g. within the framework of control households).
- **The reliability of the measurement systems:** it is difficult to estimate the quality of the measurement system implemented by the different actions (monitoring of established methods or standards for the implementation of characterization actions, controls and corrective analysis of the weighing data reported by the control households).

However, the cross-analysis of such quantitative impacts allows the identification of trends and gives good indications on their general effectiveness.





The following section describes the results of the comparative analysis carried out on the five categories of action described in the previous session. The comparison focuses on the impact generated by the actions, which is measured in terms of the amount of food waste that could be saved as a consequence of the adoption and implementation of the practices.



## REGIONAL AND NATIONAL STRATEGIES AGAINST FOOD WASTE

The four strategies identified from the desk research generally address food waste across the entire food value chain. Table 1 below presents key information on these strategies.

Table 1: key information on the four strategies identified

|   |  |                                 |  |
|--|---|---|---|
| LOVE FOOD HATE WASTE<br>SINCE 2007<br>UNITED KINGDOM   | MÁS ALIMENTO, MENOS DESPERDICIO<br>SINCE 2013<br>SPAIN                            | ANTI-GASPI<br>SINCE 2014<br>LUXEMBOURG  | LFHW SCOTLAND<br>SINCE 2009<br>SCOTLAND   |
| TARGET   |   |   |   |
| At first: all kind of households<br>Then: the 18–34-year-old   | All kind of households, schools   | All kind of households  | All kind of households  |
| MESSAGES   |   |   |   |
| The significant quantities of food waste<br>The value of food<br>The potential economic savings<br>Environmental impact (global warming) | Using food well"<br>Link with the "Mediterranean diet" and dietetics              | Moral and ethical obligation<br>Importance of the quantities thrown away<br>Environmental impact (resources, CO2) | Climate impact<br>Economic cost   |
| BUDGET   |   |   |   |
| 0.17 €/cap/year  | 0.01 €/ cap/year  | No info   | No info   |
| RESULTS  |   |   |   |
| 31.5% reduction of avoidable food waste per citizen between 2007 and 2018  | 6% between 2015 and 2016  | 30% per household between 2016 and 2019   | 6% between 2009 and 2014 (total food waste)   |

Within this context, households are a key target audience, for their significant contribution to food waste generation (from 30 to 60% depending on the country and the type of assessments). The "Love Food Hate Waste" campaign and its Scottish declinations present more than 10 years' experience, while the other two started several years after. Most of the monitoring data for the household level is obtained through food waste characterisation led at national level.

In terms of monitoring, two campaigns stand out:

- The "Mas alimento, menos desperdicio" ("More Food, Less Waste") campaign (Spain) which set up an observatory of 4,000 households who are surveyed every two years to monitor changes in food waste through weighting;
- The "Love Food, Hate Waste" campaign (UK) which offers the most insight on the monitoring data, with efforts to contextualise food waste generation by identifying factors that may explain food waste trends, such as the economic context and food prices. A simulation tool has also been developed to simulate the impact of different actions. In addition, a biannual survey allows the campaign developers to compare the evolution of wasted

quantities with the perception and prevention actions adopted by households, as well as trends (for instance changes induced by the COVID-19 pandemic).

In terms of quantitative results, it is also the *Love Food, Hate Waste* campaign that has shown the most significant impact: a -31.5% reduction of avoidable food waste quantities per capita between 2007 and 2018. Several factors might be at the base of this success. It might be linked with the long duration of the campaign, or with the fact that food waste generation is quite high compared to other territories. The other 3 campaigns show more limited results (stable or fluctuating quantities in Spain, 6% reduction between 2009 and 2014 in Scotland). The *Anti-Gaspi* campaign in Luxembourg indicates an increase in household food waste of 8% between 2016 and 2019, but a reduction in the proportion of avoidable waste of 30%, which it attributes to the various awareness-raising actions implemented, yet little details are available on the impact of individual actions and the potential role of external factors.

Little data is available on managed resources. The "Love Food Hate Waste" campaign would have costed an average of 0.17 €/inhabitant/year between 2007 and 2015, compared to 0.01 €/inhabitant/year for the Spanish campaign between 2013 and 2018 (all actions taken together in both cases, so not only for households).

Some messages addressed to householders are similar from one strategy to another: the importance of household food waste (in quantities, in proportion to the total losses), the economic impact on the household budget, or the link with climate change mitigation. Other messages could be identified: the ethical aspect, the value of food, or the culinary culture.

## FOOD WASTE MEASUREMENT

Three of the four identified operations were implemented at relatively large scales, with population samples ranging from 240 to 500 households per operation. The fourth operation identified was selected because it targeted about 30 low-income households. Each of the different operations implemented a specific approach:

- The "Zéro-Gâchis Académie" operation implemented in France in 2019 proposed to different household typologies the adoption of 3 practices among a set of 9 available, thus allowing comparisons by household typology, but also comparing the efficiency of the different gestures.
- The operation implemented in Japan in 2019 looked at the impact of the message/feedback given to participants: one group only had information on the quantities avoided, while the other had an estimate of the savings made.
- The operation "Save the Food, San Diego" implemented two programs, one 15-week program and one 6-week program.
- The operation "Food First" implemented in Washington DC in 2020 involved low-income households who were considered as "action researchers" and were paid \$100 per week.

The main information is presented in the following table:

Table 2: information on the food waste measurement operations

## INFORMATION ON THE FOOD WASTE MEASUREMENT OPERATIONS

|                                 | <b>ZÉRO GÂCHIS ACADEMIE,<br/>2019 - FRANCE</b>   | <b>FOOD WASTE DIARY APP,<br/>2019 - JAPAN</b>  | <b>SAVE THE FOOD, SAN DIEGO!,<br/>2019/2020 – UNITED STATES</b>  | <b>FOOD FIRST,<br/>2020, UNITED STATES</b>  |
|---------------------------------|--|--|--|---|
| <b>DISPOSITIVE AND MESSAGES</b> | 3 prevention behaviours to choose from among 9<br>Message: be aware of your own food waste   | The first group receives a report on the quantities wasted by type of food and waste, as well as an estimate of the costs<br>The second group receives only the information on the quantities wasted | Environmental and economic impact<br>Participants can form teams and accumulate points. A ranking is available on the initiative's website | Compensation for some participants of \$100/week. These "action researchers" were also able to present their results at the end of the project                              |
| <b>PARTICIPANTS</b>             | 243 households, 744 people   | The study mentions 322 users whose data was analysed, but does not specify the overall panel   | 15- week programme: 492 participants<br>6-week programme: 395 participants   | 30 participating households, 80% retention  |
| <b>RESULTS</b>                  | 59% reduction in waste, from 25.5 to 10.4 kg per inhabitant  | 30-40% reduction over 3 months   | 38% reduction in food waste (including non-consumables) for 15 weeks<br>34% reduction in food waste for 6 weeks                            | Average reduction of 60% of avoidable waste   |
| <b>OTHER RESULTS</b>            | 92% satisfaction<br>Least easy task: planning meals in advance. Easiest task: save leftovers<br>Most effective: preparing the right portions. Most unaware of liquid waste.<br>7.6% participants dropping out during the project, 0% after the end | The study did not conclude on the impact of information about the cost of waste on prevention. This is potentially due to the low quantities wasted over 3 months.                                   | Many dropouts due to COVID.<br>Comparable results between the 2 programmes, but better retention for the 6-week program                    | The participants also appreciated the action and the participatory and community aspect. A prize-giving ceremony was organised (lowest production, highest reduction, etc.) |
| <b>INITIAL LEVEL</b>            | Average: 25.5 kg/cap/year<br>Single persons: 36 kg<br>Couples without children: 29.3 kg<br>Urban: 31.4 kg / Suburban: 20.1 kg<br>Single-parent families: 18.9 kg   | 85 kg/household  | No data  | 49 kg/person/year   |



The four operations are characterised by quite impressive results in terms of participation and avoided quantities: good retention of participants, except for the San Diego action that attributes dropouts to the COVID-19 pandemic, and considerable reductions, ranging from 30% to 60% on average, depending on the action. For example, the Zero Waste Academy reports a reduction in food waste from 25.5 kg/inhabitant/year to 10.4 kg in a time span of about 2 months, as well as a shift in consumers behaviour with permanent adoption of food waste prevention beyond the end of the measures testing period.

In the Japanese case, the promotion of the measuring practice did not identify whether the information on the financial savings achieved by households had an influence on the adoption of food waste prevention behavioural change by households; this is attributed to the fact that the operation only lasted 3 months, and that the financial savings achieved within this period are believed to be too small to. The two operations conducted in San Diego showed that the duration of the operation had little impact on the results (38% reduction over 15 weeks versus 34% over 6 weeks).

Overall, these different actions recognize that food waste weighing and individual evaluation of food waste generation successfully managed to raise households' level of awareness, while monitoring the impact of actions allowed to demonstrate their actual effectiveness. The setting up of such a measuring system allows for example to highlight aspects of food waste that are not necessarily well identified by households (e.g. waste of liquid products). The French experience has also highlighted the relevance of the conservation of food leftovers as the simplest action to adopt, and the preparation of meals in the right portions as the most effective practice that can reduce the leftover portions likely to become food waste.

The promotion of these “self-assessment” practices confirmed that making individual households aware of the reasons of their own food waste generation can unlock their willingness to make that behavioural shift and lead more sustainable and conscious daily practices towards household food management.

**Making households  
AWARE  
of the reasons of their  
FOOD WASTE  
GENERATION  
can unlock their  
willingness  
TO CHANGE  
BEHAVIOURS**

## COMMUNICATION CAMPAIGNS

Many communication campaigns on food waste are developed across the world, yet very few adopt a comprehensive approach that aims to quantify the impact that these campaigns generate. Among the revised literature that was analysed for this report, only 2 communication campaigns have documented their results in terms of avoided quantities. These two campaigns were implemented in London, the first in 2013 in different boroughs of West London, the other in 2018 as part of the European project Trifocal<sup>11</sup>. Both campaigns were implemented on a fairly large scale (7 and 15 London boroughs respectively). Key information is presented in the following table:

<sup>11</sup> <https://trifocal.eu.com/>

Table 3: information on the documented communication campaigns

| "SMALL CHANGE, BIG DIFFERENCE"<br>2018<br>LONDON   | TARGET   | LFHW WEST LONDON<br>2013<br>WEST LONDON  |
|--|----------|--|
| Particular focus on London households between 18 and 34: students, young working parents, etc.   | MESSAGES | All types of households  |
| Importance of waste and large contribution from households<br>Emphasis on certain actions: cooking ideas, freezing many foods, buying more often and in smaller quantities, etc. | COSTS    | Practices to reduce waste<br>Reducing waste saves money  |
| No details on the campaign   | RANGE    | 0.11€/ citizen   |
| 15% of Londoners aware of preventive measures  | IMPACT   | 14% of the population reached by the campaign  |
| Reduction of the avoidable portion of household food waste by 9% and 14% of bio-waste  |          | 15% of food waste on the whole panel, -14% of food waste<br><br>35% of food waste for households that know about the campaign and have applied the promoted gestures, -43% of food waste |

Both campaigns developed similar approaches in terms of messages (e.g. concrete actions to reduce waste at home, the significant quantities of household food waste, and the associated costs savings), and activities (i.e. media campaigns, posters, online communication, direct communication in the form of workshops and stands, food distribution collaboration).

The 2018 campaign developed an interesting approach: it targeted a specific audience (18 to 34-year-old: students, young working parents and young adults), and implemented 3 pilots in 2-3 boroughs each, followed by focus groups with residents to assess the relevance and clarity of the messages. Following these 3 pilots, a "large-scale" campaign was carried out in 15 boroughs.

The two campaigns yielded fairly similar impacts. These were estimated using surveys and waste characterisations. As a results, around 15% of the population was reached by the campaign and made aware of preventive actions, a reduction of avoidable food waste of around 15% for the first campaign and of around 10% for the second campaign was reached for the whole territories covered by the action (9 kg/hh/yr and about 8 kg/hh/yr respectively). In addition, the first campaign established that the 15% households that were actually reached the campaign reduced avoidable their food waste by more than 40%, a reduction comparable to the households participating in the "food waste measurement" operations.

The cost is only known for the first campaign and is estimated at 0.11 € per inhabitant, over the 6-months duration period of the action.

## ACTIONS ON FOOD LABELLING

Two actions could be identified: the first one carried out as part of WRAP's "Love Food, Hate Waste" campaign, the other one launched in 2018 in Norway by Mattvett, a company specialized in actions against food waste. These actions targeted food producers and retailers but aim to reduce waste at home via better information about how to store and use food products. The two projects have sought to clarify information on expiration dates (use-by dates, or best-before dates), generally misunderstood by consumers, or incorrectly used by producers. The main information is presented in the table below:

Table 4: information on the actions on food labelling

| METTVAT ACTION ON DATE MARKING<br>2018 - TODAY<br>NORWAY  | LFHW<br>2009-2017<br>UNITED KINGDOM  |
|---|--|
| 16,000 €  | No info on the action budget   |
| No data on quantities avoided, but the share of consumers routinely throwing away products after the expiration date dropped from 30% to 26% between 2015 and 2017. | It is estimated that these actions have reduced GA by 10 to 15% between 2007 and 2018  |
| 7 out of 10 consumers say they are more likely to trust their own judgment before throwing away expired food.   | The number of products with 2 dates (use-by dates and end of shelf date) went from 40% to 3% between 2009 and 2015   |
| Effective among those under 30  | Hard cheeses and pasteurised fruit juices have mostly abandoned the "use by" date in favour of the "best before" date  |
|   | 25% of pre-packaged fresh products no longer have an expiration date (e.g. potatoes)   |
|   | The "snowflake" logo for products that can be frozen is applied on nearly 50% of products (compared to 15% in 2009), while the "freeze on day of purchase" indication is gradually being abandoned |

Three different aspects have been analysed and further addressed by the action. They responded to the need to:

- Clarify the food safety regulations in cooperation with the health and safety authorities: some products display a "use-by" date or a "best before" date on products for which there is no obligation or risk;
- Identify, promote, and implement good practices in terms of how key information on dates and storage is presented on the labels;
- Estimate the potential for food waste reduction and monitor the impact of the improved labelling on consumers' behaviour and household food waste generation.



WRAP assesses that these actions contributed to a 10% to 15% reduction in food waste between 2007 and 2018 (estimate based on their simulation tool).

The two projects have also developed more specific actions improving the labelling system, such as the drafting of a practical guide for producers specifying which labelling terminology to use for which products, the disappearance of the "display until" expiration date format, the improvement of information on freezing indications (logo indicating the possibility of freezing or a deadline for freezing), a logo inviting people to "smell, look, and touch" the products before consuming them, or the modification of the formulation "best before XX/XX/XXXX" into "best before XX/XX/XXXX, but still good after".

The projects mention changes on specific products, such as the replacement of use-by dates with best-before dates on hard cheeses and pasteurized fruit juices, or the elimination of use-by dates on certain packaged fresh products such as potatoes.

An interesting point made by the Norwegian action is its effectiveness of the actions with the population under 30, a key target audience for food waste reduction.

## AWARENESS CAMPAIGN TARGETING SMALL BUSINESSES

One action targeting smaller businesses could be identified, which also assessed its impact on consumers' behaviours. The action was implemented in Alsace, France, in 2017, and consisted of a programme to provide support to various small shops selling food items so that they could reduce their own waste and improve waste sorting performances. The targeted shops included bakeries, pastry shops, grocery stores, butcher shops, and delicatessen shops with a sales area of less than 400 m<sup>2</sup>. In these small to medium-size local businesses, an initial diagnosis was carried out to determine waste generation and identify potential improvement. This led to the identification of a number of different actions that could be implemented at the shops' premises, ranging from food waste sorting, food loss assessments, products' food safety status monitoring over time, and distribution of unsold products. The stores receive the support of an environmental consultant, who carried out a diagnosis also at the end of the project with the aim to award a sustainability label to the retailer.

At the same time, prevention actions aimed at consumers were organised with the support of the retailers, using a small stand that was installed in the store, as well as a larger stand that could be placed outside. The information focuses on the promotion of awareness raising actions for consumers which would produce a positive impact in terms of more conscious purchasing choices and less food waste generation at home. Some of the actions promoted by the food businesses included the drawing up of shopping lists, buying just the right amounts, understanding of expiring dates, food storage good practices, and cooking leftovers receipts.

A self-assessment quiz was also sent to the various individuals that participated in the initiative, allowing personalized advice to be provided. This quiz was filled in by about 1,400 respondents and made it possible to assess the reduction of food waste linked to these different actions, by taking into consideration the new individual food waste prevention practices carried out by householders. The action estimated that the awareness campaign carried out through this initiative managed to achieve a food waste annual reduction of 8 tons, equivalent to 6 kg per respondent, which represents a 20% reduction in their food waste generation compared to the

French average food waste. However, these values come from a simple assessment, and have not been measured using characterisation.

## IDENTIFIED RECOMMENDATIONS

### RECOMMENDATIONS RETRIEVED FROM THE 13 DOCUMENTED ACTIONS

#### **SUCCESSFUL FOOD WASTE REDUCTION STRATEGIES RELY ON A COMBINATION OF DIFFERENT ELEMENTS**

These elements can be recurring campaigns and "highlights", simple and clear messages targeted at specific populations, collaboration with different stakeholders, and continuous monitoring of the impact on prevention behaviour and waste reduction. Such campaigns require significant resources, but they allow for the ability to understand causes of food waste, adjust intervention strategies and quantify the impact of consumers' behavioural change. The required running cost for this kind of strategies is in the range of €0.10 to €0.15 per capita per year, over several years.

#### **THE "FOOD WASTE MEASUREMENT" OPERATIONS LED TO SIGNIFICANT FOOD WASTE REDUCTIONS**

It is likely that these reductions are the result of households becoming aware of their own waste, but also of monitoring the impact of implementing preventive actions. Such programs, implemented over a period of 6 weeks (2 weeks of diagnosis, 4 weeks of implementation, without counting the time for preparation, promotion, and recruitment of participants) seems to give good results. However, it is difficult to know whether they can be implemented on a large scale and carried out by households in an autonomous manner. It may also be necessary to identify incentives for households to undertake such self-diagnosis in the first place.

#### **THERE IS A REAL POTENTIAL TO REDUCE HOUSEHOLD FOOD WASTE BY CLARIFYING THE INFORMATION PRESENTED ON PACKAGING LABELS**

It can include expirations dates, information on preservation and freezing, etc. Often the focus is on consumers' understanding of labelling terms. Yet, it is also important to run an assessment on the use of proper labelling systems for food producers as incorrect labelling terminology on a non-perishable product can induce consumers to dispose of it when, in terms of food safety, the product was still good for human consumption. It is interesting to make producers aware of these good practices, while ensuring compliance with health regulations.

#### **THE DIFFERENT ACTIONS ARE MAINLY BASED ON COMMUNICATING MESSAGES TO ENCOURAGE ACTION AND PRESENTING CONCRETE PREVENTION BEHAVIOURS TO ACT.**

Yet very few initiatives have gone further than that, creating stronger incentives to act for households. The messages generally focus on the significant quantities of food waste generated by final consumers, the cost that it represents for households, and the impact produced on the environment (mainly on global warming), even though there were not necessarily efforts to tailor the messages to the different target audiences.

#### **ACTIONS LIKE THE DIRECT SENSIBILISATION CAMPAIGN RUN IN ALSACE SHOW A DIFFERENT APPROACH TO AWARENESS RAISING.**

It is done through the mediation of human interaction rather than physical posters or digital campaigns.

It should be emphasised that the quantitative data collected are extremely limited and probably difficult to compare. In general, the monitoring of prevention is not very formalised, and the monitoring methods are far from being homogeneous from one territory to another, let alone in one given territory. It is also difficult to compare the levels of food waste from one territory to another; it is therefore risky to put forward a reduction potential for an ambitious strategy to combat food waste based on other territories.

However, these different actions tend to provide quantitative evidence when it comes to the effectiveness of the different measures and practices listed above. The approach developed by the Love Food Hate Waste campaign is especially interesting when it comes to more tailored-made measures and to monitoring and impact assessment, which enables a better understanding of drivers, incentives, and the adoption of food waste prevention practices on the long term.

## MAIN COMMON OUTCOMES IDENTIFIED IN THE LITERATURE

Due to the limited number of food waste reduction actions that have quantified their impact in terms of avoided food waste quantities, a complementary bibliographical study was carried out, focusing on more general recommendations to promote household food waste prevention. About 20 publications including best practices, project reports and tailored research have been reviewed. Within this literature (listed in the bibliography) the main outcomes that emerged were the following:

### TARGETED AUDIENCE:

- The different publications often mention the same key target audiences on which communication actions should be directed: **families with young children, younger population (18-34 and 35-44 years old), or people on diets**, who tend to waste more food, or are less aware of prevention behaviours.
- Many campaigns propose **actions targeting children (in schools)**, but others focus more on those **who manage food at home** (those who plan and make purchases, prepare meals, manage food stocks, etc.).
- **Other factors intrinsic to households may impact waste levels:** fear of running out of food, ability to plan how much to buy and how much to prepare, propensity to throw away leftovers, or lack of cooking skills.
- **The target audiences must be well identified according to different parameters:** consumption and waste habits (wasted products, generators), motivations, knowledge, so that actions can be adapted to their concerns and situation. Food waste habits should be linked with socio-economic and cultural characterisation.

### BEHAVIOURS:

- One of the attitudes very often identified by the literature is **the discrepancy between the perception of the inhabitants on their own food waste generation and the reality**. Many households seem to be unaware of their own food waste generation, tend to minimize it, or to attribute it to exceptional situations that can hardly be avoided.



- **Some types of food waste are poorly identified by households**, notably the waste of liquid products (milk, juice, etc.).
- **Consumers interpret the expiring dates differently for different products**. For example, they are more likely to follow the use-by dates on yoghurts than for e.g. packaged vegetables, although in many cases they rely on their own judgment.
- **Similarly, good storage practices are better known for some types of products** (bread) than for others (oranges). In general, people are interested in information about optimal storage for different products, as well as for freezing options.
- **During the first wave of the COVID-19 pandemic, English households implemented more preventive actions**, but the behaviours did not persist when lockdown measures were lifted.

## KEY MESSAGES:

- **The messages often revolve around the dissemination of "good prevention behaviours" for households**, mainly on planning, purchasing, storage, preparation, and leftover management habits. In general, key actions are organised in a list of 6 to 10 categories, sometimes declined according to the time of the year (seasons, particular holidays, etc.).
- **It seems more important to highlight and develop consumers' actions and skills rather than to insist on the negative impacts of waste**. It is also important to identify local specificities when it comes to food waste generation to focus on adapted actions (e.g. raising awareness on the storage or use of a particularly discarded product, or on use-by dates if the food waste is characterised by a large proportion of products that are still packaged).
- **It is important to communicate on simple and targeted actions**. Too much information can be lost by households, who might prefer to ignore the advice if confused.
- **There is a potential for campaigns to make food waste reduction a social norm**. If households see that others are taking action (especially relatives, or people they identify with), they may be more likely to take action themselves.
- **Some of the arguments used to promote food waste reduction are recurrent**: the cost to households, the "ethical" aspect, the environmental impact. It is important to adapt these messages to the different target audiences, who are more or less sensitive to them.
- **Use the right people and organisations to spread the word** according to the messages to reach the desired target audiences, according to their credibility or their capacity of reaching the right target groups.

## GENERAL RECOMMENDATIONS IDENTIFIED IN THE LITERATURE

### **DEVELOP MONITORING SYSTEMS BEFORE IMPLEMENTING THE ACTIONS**

Methods for monitoring actions should be developed before the actions are implemented, making a comprehensive planning of the overall action, and including the quantitative assessment of impact, the investment required and a monitoring of the overall effective spending and achieved food waste reduction. These steps include, but are not limited to, establishing a baseline, defining a monitoring protocol, providing human and financial resources for the monitoring, in addition to the ones allocated to the implementation of the action.

### **PRESENT PREVENTION ADVICE WHERE PEOPLE ARE IN DIRECTLY IN POSITION TO ACT**

Messages and advice on preventive actions are more effective if they are presented/posted where people are directly in a position to act. Some examples: advice on quantities to buy or awareness raising on the misshapen fruits and vegetables should be displayed directly on stores, advice on how to store food should be placed in the kitchen or on the refrigerator. It can be also interesting to promote the materialising of a space for leftovers and food to be consumed in priority in the refrigerator, so that householders do not forget about them and get used to consume them in time.

### **ADAPT MESSAGES TO THE DIFFERENT TARGET AUDIENCES**

The communication actions must be adapted as much as possible to specific target audiences, with messages adapted to their food waste and household *profiles*, their motivations, and their constraints, and by using intermediaries and communication channels that are effective in attracting their attention and induce them to take action.

### **INTEGRATE FOOD WASTE PREVENTION IN A LOCAL FOOD STRATEGY RATHER THAN IN THE WASTE STRATEGY**

The prevention message is more effective when it is integrated into global strategies on food (e.g. promoting local and sustainable food), rather than in waste prevention and waste reduction strategies. In addition, it appears that "producer to consumer" short food supply systems such as Community Supported Agriculture and Alternative Food Networks generate less waste, throughout the food supply chain, and hence also at consumer level. More generally, the local food offer can have a significant impact on household food waste generation; having a better access to food retailers can lead householders to buy groceries more frequently, making their management of stock easier, thus leading to less food waste. How smaller, more local food retailers or shorter food circuits can positively impact food waste reduction should be further investigated.

Food waste reduction can be achieved by addressing other policies than food or waste per se. For instance, giving more free time to households could lead to lower food waste generation.





PART 3

# SUMMARY OF KEY RECOMMENDATIONS FOR HOUSEHOLD FOOD WASTE PREVENTION



## PROMOTE SELF-ASSESSMENT OF INDIVIDUAL FOOD WASTE GENERATION

### CONTEXT AND CHALLENGES

Food waste prevention is generally perceived as a positive action that entails various benefits. However, studies generally show a discrepancy between the perception that households have on their individual food waste generation and the actual wasted quantities, meaning that households will generally underestimate or deny wasting food on a regular basis. It is difficult to determine whether this is because food waste generally represents small quantities produced over time, or whether residents perceive only part of the waste as food waste (e.g., only food waste related to leftovers and not to spoiled products, or only solid food waste and not liquids discarded in the sink). It is also possible that households do not fully perceive the potential for waste reduction, or that they believe that food waste is related to unforeseen events and is impossible to avoid.

The benchmark assessment presented in part 2 shows that actions engaging households to actually weigh their food waste, and monitor these quantities through time, lead to very significant decrease in their food waste generation, even when actions are organised on a limited timeframe (such as 6 weeks). Therefore, it is interesting to offer households tools that allow them to become aware of their own food waste generation, to estimate the associated negative impacts in both environmental and financial terms, and to identify corrective actions.

It is also important to identify the links between food waste prevention and food waste collection. Food waste collection can be perceived as a way for households to identify more clearly the food they waste. However, sorting waste might lead household to stop seeing them as such, and to consider that it “compensates” the negative impact of food wastage. In general, it seems that food waste collection and food waste reduction are not necessarily perceived as related topics by households, and that the behavioural changes they require are quite distinct. Food waste reduction focuses mostly on planning meals, shopping, and cooking habits, or storing systems, while food waste sorting is more linked with waste separation and pre-collection at home. Coordinating food waste prevention and food waste collection strategies is important to clarify the scope of the actions and to avoid confusions.

**Households perceive FOOD WASTE PREVENTION AS HIGHLY POSITIVE yet they generally UNDERESTIMATE THEIR OWN FOOD WASTAGE it is therefore relevant TO SUPPORT THEM IN THE ASSESSMENT of their individual food waste generation**

### PROPOSITION OF ACTIONS



#### **DEVELOP SELF-ASSESSMENT TOOLS AND PROMOTE THE ADOPTION OF PREVENTION BEHAVIOURS BY HOUSEHOLDS**

Providing insight on individual food waste generation and on the actual effects of simple prevention actions seem to lead to significant reductions of food waste. However, “food waste measurement” operations generally require significant resources to be followed up. It could be interesting to explore ways to allow households to conduct such a process independently. The

main challenge is to define ways to disseminate the process and the tools available, and to identify incentives to encourage action.

## PRACTICAL CASE

### City of Bruges: The “Food Winners Brugge” initiative

This project started in 2020, when 50 volunteers were recruited as ambassadors for the project, trained, and then monitored their actions and impacts when tackling 7 “challenges”, including initial assessment, implementation of good practices on purchase, storage, and cooking, and final measurement.

The obtained results were used to upscale the campaign to more participants: 500 in 2021, and 5,000 in 2022, through the engagement of associations, companies, and schools.

It managed to keep the same level of reduction when going from 50 to 500 participants, with a 65% reduction of food waste in both cases. The project in Bruges plans to award prizes (restaurant meals, cooking workshops, etc.), which could also reach a wider audience than just households interested in the issue of food waste. Analysis of the 2022 edition could provide insight into how more households can be supported while limiting the resources allocated to such projects.

<https://foodwinnersbrugge.be>

Whenever implementing such type of action, identifying the socio-demographic characteristics of the participants would allow to relate the successfulness of the action to the characteristics of the adopters. This would also allow to identify target audiences and potentially under-represented shares of actors for which specific actions to encourage their participation should be designed.

To monitor trends over time, it is also suggested to carry out a medium-term follow-up assessment of the prevention actions still applied by the participants (for example 6 months or one year after the operation), in order to better appreciate the impact of such processes on household waste and analyse variations in behavioural aspects once an initiative is launched. Few actions identified in this study planned for such a follow-up, leading to uncertainty of the effects of the measure in the medium and long-run.

### DEVELOP REGULAR PRACTICAL AWARENESS RAISING CAMPAIGNS THROUGH SCHOOLS

Given the evidence of positive impact generated by actions promoting weighting of food waste at household level, it is suggested for municipalities, and national authorities more in general, to set-up a multi-annual planning of national or regional awareness raising campaigns by selecting a week of food waste weighting at home for school kids. Through these campaigns – to be held at regular time intervals (i.e. few times a year for several years) – households will be invited to participating in the weighting process through dedicated programs run at schools where awareness about food waste is raised already in primary and secondary schools. This kind of initiatives lead to multiple benefits, namely:

- engagement at an early stage of children on the importance of food waste prevention;
- potentially high participation as the programme would be coordinated by schoolteachers and for which children will feel committed to actively participate in;

- possibility to collect and compare data at large scale when the initiative is run at regional or national level;
- possibility to analyse trends in food waste generation by region within the same country, and from one year to the other;
- possibility to analyse, discuss and improve the weighting system methods applied at home (i.e. time selection, food waste category, edible and non-edible components, solid and liquid waste differentiation).

When such kind of initiatives are run by several thousands of families on regular basis, the higher the frequency of *exposure* to the food waste challenge, the higher the probabilities to achieve positive impact in awareness raising and modification of habits in term of food purchasing, storage and consumption.

## CAPITALIZE ON FOOD WASTE MEASUREMENT ACTIONS TO MAKE WASTE REDUCTION A SOCIAL NORM

Various publications indicate that making food waste prevention a social norm is one of the most promising ways to promote the implementation of sustainable household actions<sup>12</sup>. Individuals tend to conform to the behaviour of their relatives, or what they perceive as the "normal" behaviour of the majority, and for this reason a positive action by peers can have a wide multiplier effect among a community. In addition, as individuals, we are more likely to take into account messages and advice from people that we know, rather than from authorities.

There is therefore a potential for the multiplication of action by capitalising on the experience of participants in food waste measurement operations, preferably during "live" social events (in the context of neighbourhood associations, sports, cultural events, etc. to which the participants may be affiliated with). It might be useful to facilitate this "testimonial" work by providing communication materials or dissemination aids to participants in "food waste measurement" operations. It could also be considered to give *performance prizes* such for example cooking classes, local products, tickets for cultural events, to motivate participation in such initiatives (.

A final possibility would be to recruit "influential" personalities who could reach different types of target audiences and offer them to participate in food waste measurement operation, and later share their experience to the public (on social networks, in the media, etc.).

## IDENTIFY SYNERGIES WITH FOOD WASTE SORTING

Food waste sorting can compete with the food waste message, or conversely, can raise awareness or even equip households to reduce their food waste.

Other food waste measuring instruments could be considered, such as biowaste bags offered to households to estimate their food waste (e.g., with scales to estimate the volume wasted in a week, and which can also be thrown away with the biowaste). Such bags could be offered on demand to capitalise on new sorting habits and allow households to better identify their waste.

<sup>12</sup> Fight Food Waste Cooperative Research Centre (2020), Global best practice for designing interventions to reduce household food waste



## PRACTICAL CASE

WRAP: study on food waste communication

In 2013, WRAP proposed a study related to food waste communication, specifically to question the assumption that sorting biowaste could promote waste reduction. However, the study did not find a link between food waste sorting and waste reduction (either positive or negative), meaning that sorting food waste did not necessarily lead to lower or higher quantities of avoidable food waste.

To avoid confusion between prevention and sorting, WRAP advises communities implementing selective food waste collection with the following schemes:

- Between 6 and 2 months before the launch, communicate on food waste and waste separation, highlighting the waste hierarchy (or more simply by indicating that waste reduction has a more significant impact than the sorting of "avoidable" waste), and by highlighting various simple actions to reduce waste. The upcoming collection can be promoted as a solution for "non-avoidable" waste.
- Just before and during the implementation of the collection, it is advisable to focus on food waste collection: what to sort, how to sort and store the waste, how the service is organised, and the destination of the sorted waste.
- At the latest 8 months after the implementation of the selective collection, thank households for their participation by highlighting the progress made, and communicate again on food waste and prevention actions.

<https://wrap.org.uk/resources/guide/waste-prevention-activities/food-communication-research#>

### INSTRUMENTS TO BE EXPLORED AND COMMUNICATION CHANNELS

The instruments to be explored for promoting and implementing such experiential awareness of individual food waste generation by households are the following:

- **Incentives for participation:** to involve households that are not necessarily concerned about food waste, it is useful to think of incentives (i.e. food-related prizes, money-saver calculator).
- **Messages and feedback:** participants in food waste measurement operations could be sensitive to different types of messages and feedback on the impact of prevention actions. Beyond the quantitative reductions (e.g. in kg/person/year), the avoided costs can be considered, reported from 150 to 200 € by the different actions identified depending on the context. The time that can be saved by households thanks to a better management of food and food waste can also be relevant for certain households.
- **Equipment:** different means to monitor and differentiate food waste could be considered, such as organic waste bags or containers for edible and non-edible food waste; separate collection containers for different categories of waste (i.e. vegetables and fruits, bread, meat and fish, liquid food) or differentiated containers for source type of food waste (i.e. food not used, food partially used, leftovers)

Different communication channels can be used for participant recruitment, and for the dissemination of results:

- **Direct approach:** "physical" presentations could help explain the process, or present the positive benefits and impacts, with testimonials from previous participants.
- **Schools:** awareness raising campaigns channelled through educational programmes at school where children and young adults are active players in the collection of data, and in the analysis of the results, guided by teachers and personnel of public organizations or associations running food waste reduction campaigns;
- **Media** to present the approach, enlarge the target audience and disseminate the results;
- **Social networks:** it could be interesting to invite satisfied participants to share their experience on social networks (Facebook groups in which they participate, etc.), providing them with suggestions for content to share if necessary.

## POTENTIAL IMPACT INDICATORS

These indicators are suggested to be adopted for the monitoring of progress and impact:

|  |   |   |   |   |
|--|---|---|---|---|
| <p><b>NUMBER OF PEOPLE/HOUSEHOLDS</b><br/>who have completed a waste assessment and reduction program, and associated reductions (incl. household composition and socio-demographic indicators).</p> | <p><b>NUMBER OF PEOPLE PER TARGET AUDIENCE IDENTIFIED,</b><br/>possibly by category (age, socio-professional background, housing type, income, etc.).</p> | <p><b>KILOGRAMS OF FOOD WASTE GENERATED PER INDIVIDUAL (KG/PP/WEEK)</b><br/>before, after the participation in the initiative, in parallel with the food waste prevention practices implemented. Estimation of the quantities of food waste avoided thanks to the campaign.</p> | <p><b>NUMBER OF PEOPLE SENSITIZED</b><br/>by the participants, or number of presentation sessions with testimonies from the participants.</p> | <p><b>EVALUATION OF THE SUSTAINABILITY OF THE ACTIONS OVER TIME</b><br/>via a survey on the actions still implemented by participants and the difficulties encountered.</p> |
|--|---|---|---|---|

## INFORM, RAISE AWARENESS, PROMOTE PREVENTIVE ACTIONS

### CONTEXT

Communication has 3 main objectives:

- To raise awareness among households about the extent and negative impacts of food waste to encourage individual action;
- To make people aware of actual prevention behaviours, their practical implementation, and their impact;
- To show that all the different actors in the food value chain are committed to fighting food waste: producers, distributors, restaurant owners, public authorities, etc.

Previous studies and projects highlighted the importance to set an "on-going" communication campaign with recurring occurrence to make sure that the key messages reach the population.

### PROPOSITIONS OF ACTIONS



#### MAKE FOOD WASTE A RECURRENT COMMUNICATION THEME

Most of the ambitious strategies to reduce food waste use a common visual identity that is used in the different campaigns and initiatives. It seems more relevant to link the issue of food waste to a "food" strategy rather than to a "waste" approach; actions to fight food waste are primarily about food. Moreover, the reduction of food waste also involves actions directly related to food: promotion of local food production and distribution systems likely to generate less waste, promotion of bulk sales allowing to opt for more adapted portions, promotion of quality food which encourages to waste less.

A common visual identity (logo, font, key messages, etc.) can thus be used for the different communication actions carried out by the different stakeholders. It is also interesting to consider a common visual identity on a larger scale (national or regional) to reinforce its impact and the visibility of individual actions.

It may also be interesting to set up a communication monitoring committee with the main stakeholders (i.e. retailers, food chains and restaurant owners, associations active on food, cooking, or zero waste, or able to reach priority target audiences), which could lead to the identification of potential actions, ensure their participation during more targeted events or within the framework of an annual "highlights" or recurrent appointment. It is also useful to show

**AMBITIOUS STRATEGIES  
against food waste have  
THEIR OWN VISUAL IDENTITY**

**To enhance engagement,  
SHOW THE COMMITMENT  
OF THE VARIOUS PLAYERS  
of the food value chain**

**Include the food waste topic  
IN THE FRAMEWORK OF  
OTHER SIMILAR CAMPAIGNS**



households that the various players of the food value chain are committed to reduce food waste, and that the responsibility for food waste is not solely attributed to them.

It is advised to ensure consistency of the planned food waste reduction action with the national food waste strategy. This will on the one hand optimise the visibility of the actions while on the other, develop approaches that are in line with government authorities planning policies.

Finally, it is also useful to include the topic of food waste in the framework of other axes related to food (local production, food supply, etc.), in particular by making the different actors aware of the stakes of food waste and by giving them tools to reach consumers (i.e. information on food quality, advice on conservation and preparation, etc.).

## ORGANISE AN ANNUAL HIGHLIGHT

A single regional or national

**ACTION DAY  
OR WEEK  
against food waste  
MIGHT BE MORE  
EFFECTIVE  
than  
DIFFERENT  
AWARENESS RAISING  
CAMPAIGNS**

Organising a single regional or national action day or week against food waste might be more effective than organising different awareness raising campaigns at local level, especially to reach general media. This thematic day or week on food waste is important to mobilise the different stakeholders around this theme, to give visibility to the strategy by proposing a wide range of activities in different places (public space, food stores, restaurants, companies, etc.). It may be relevant not to focus only on actions targeting households, but to show that reducing waste is everyone's business.

Such an event should aim to mobilize as many stakeholders as possible engaging producers, retailers, restaurants, associations and eminent

personalities related to food, around a common, well-defined food topic (i.e. healthy food, responsible food practices, food and climate change relations). These different players could be invited to set up specific actions (visual communication, animations, workshops, etc.) taking up the visual identity and the common message of the campaign and reporting the results to the public authority coordinating the prevention strategy, according to a predefined structure (online questionnaire gathering information on the number and type of actions, the type and number of audiences reached, the qualitative and quantitative results).

Aggregating the different actions and their individual results is useful to provide figures on the reach of the campaign. This can help to reach the general media and give visibility to the food waste strategy, as well as draw attention to specific prevention actions. In this occasion, it will be also worth for the organiser to highlight the timeline of the action, not limiting the awareness campaign to a single event, but explaining the long-term vision and the overall planning and progressive steps of the initiative.

It can also be interesting to try to associate local "influencers" in cooking and food active on social networks, and who could allow to reach a younger population.

Information on planned actions and animations, prevention tips, main messages, and communication visuals, could be centralized on a dedicated online page.

## TRAINING IN PREVENTION BEHAVIOURS

Zero waste cooking workshops are regularly mentioned by the different strategies to fight food waste as an effective way to train households in practical and concrete actions, including cooking with leftovers.

In order to reach a wider audience outside of households interested in zero waste, it could be considered to train different people offering training that could indirectly relate to food waste. Events like cooking workshops, home organising and parental coaching are examples of participative actions that provide valuable advice on optimal food management practices at home addressing, i.e. meal planning, food storage and management, and meals preparation with the right portions.

## IMPLEMENTING SPECIFIC COMMUNICATION ACTIONS TO TARGET DIFFERENT AUDIENCES

Following the analysis of existing data, or even aiming at their collection, in a given year, parallel small-scale actions can be planned for different samples of the population with the aim to provide tailored messages and approaches to food waste reduction for clearly identified target audiences (e.g. 18 to 34-year-old, students, young parents, disadvantaged groups). It is then necessary to start with a characterization of the population sample, identify key trends (either existing or to be identified) within the sample, target food products to work on, either for food categories that are more frequently wasted or for food items with high carbon footprint, or select topics relevant in specific periods of the year (i.e. waste prevention during Christmas or Easter period, cold chain and food conservation during summer period, food hygiene at the start of the year, etc.).

For these more targeted campaigns, it is necessary to identify:

- **Key messages:** the message must be clear and focus on few specific, concrete actions to reduce waste, as well as motivations according to key audiences (time saving for young parents, economic aspect for students or disadvantaged audiences, etc.)
- **Communication channels and key people to spread the word:** young people will be more easily reached by online communication via social networks. Different associations and structures in contact with disadvantaged households (social grocery stores, cooperative supermarkets, local associations) could contribute to sharing key actions.

## DELIVERING "THE RIGHT INFORMATION" TO THE "RIGHT PLACE"

The analysis of good practices and recommendations shows that messages on preventive actions are all the more effective if they are presented at the time and place where people can act directly: e.g. information on storage in the store or on the packaging, indication of storage on the refrigerator with exposure in supermarkets or in refrigerator sellers' shops. Similarly, having tools for storing or preparing the right proportions can act as a vehicle for promoting preventive actions.

Provide  
**TAILORED  
MESSAGES &  
APPROACHES**  
to food waste  
reduction  
for clearly  
**IDENTIFIED  
TARGET  
audiences**

Therefore, it is interesting to display prevention actions where people buy, store, and prepare their meals. These preventive actions can address one or multiple of the following items:

- Provide advice on storing unpackaged food in stores;
- Promote food storage and preservation information on packaging (see the [next recommendation](#));
- Provide tools to remind people of good storage practices:
  - Reminder card to be magnetized on the refrigerator listing good practices on freezing, arranging food in the refrigerator, or frequent cleaning of the refrigerator to take inventory;
  - Sign, box, tray to be placed in the refrigerator to materialize a zone for products to be consumed in priority (leftovers, opened products, perishable products, etc.);
  - Storage boxes to help preserve certain types of food.

These tools could be distributed as "prizes" for participants in "focus group" type operations, during workshops, on information stands, or in food stores during specific communication campaigns.



## LINK FOOD WASTE PREVENTION WITH THE LOCAL FOOD STRATEGY

The prevention message is more effective when it is integrated into global strategies on food (e.g. promoting local and sustainable food), rather than in waste prevention and waste reduction strategies. Besides, it seems that the local food production and local food distribution/offer have a strong impact on food waste generation. These relations should be further investigated.

## POTENTIAL INDICATORS FOR OBJECTIVES AND MONITORING

Efforts should be put in the quantitative and qualitative monitoring of the actions as much as possible, focusing on the changes in behaviour and the acquisition of knowledge of the different target audiences as well as on the quantification of food waste (kg/pp/year) resulting from these changes. While it may be difficult to evaluate all communication actions individually, at a minimum, an annual survey of changes in knowledge and behaviour regarding food waste generation should be conducted. Indications on how to structure this work are provided in the [part on objectives and monitoring of the general recommendations](#). It might be relevant to monitor more closely the more specific actions by surveying the key target audiences in priority.

The annual "highlight" should be specifically monitored to identify the number of actions implemented and the media coverage, the number of people reached, and a survey measuring the impact in terms of adoption of preventive actions.



## COLLABORATE WITH STAKEHOLDERS TO IMPROVE THE INFORMATION ON FOOD PRODUCTS

### CONTEXT

The European law on Food Information to Consumers<sup>13</sup> requires that pre-pack food indicate an expiration date and an appropriate sentence to provide information on the safety or the quality of the product. There are two main types of dates used on food products, with different meanings and uses:

- “Use by” dates give an indication on food safety: food should not be eaten after the use-by date. This date is supposed to be used only on highly perishable food that can pose a risk for consumers’ health, such as fresh meat, fish, or dairy products.
- “Best-before” dates give an indication on food quality. Food can generally be consumed past this date, but the food might lose its quality in terms of taste, look, or texture.

Date marking, and in general information on food products, can be misinterpreted by both producers and consumers. Although the cases are limited, in the case of producers, a poor understanding of the correct labelling system to be used for a specific category of food product leads to a wrong formulation of the expiration date, with producers erroneously substituting the *best before* nomenclature with the *use by* format. Moreover, some controversy exists in the strictness of food safety requirements prescribed by the law, with the *use by* formats defined with a too strict limitation in the number of days between production and safety consumption

## DID YOU KNOW?

In a 2018 study<sup>14</sup>, the European Commission estimated that **10% of the 88 million tonnes of food waste generated each year in the EU are linked to date marking**. Even though food producers and retailers are generally well aware of the provision of the regulation, and that most food products are properly labelled, the study identified inconsistencies, misuse, and misinterpretation by consumers.

The study shows variability in trends across Member States when it comes to date marking. This is linked to **different definition of food safety limits at national level** but could also be linked with different storage conditions or with the reluctance of retailers to undermine a product’s association with freshness when changing the shelf life or the storage conditions (for instance, some food products might be stored in refrigerated areas to be associated with freshness, when they could be stored at ambient temperature). Moreover, some food waste generated through labelling is also the result of unpacked food items being wasted because a wrong labelling has been applied to the package and it is too time consuming to relabel the products. **Same goes with the storing advice that can be inconsistent** for the same types of products depending on the producers, leading to confusions.

<sup>13</sup> Regulation (EU) No 1169/2011 on Food Information to Consumers

<sup>14</sup> European Commission (2018), Market study on date marking and other information provided on food labels and food waste prevention

A revision of EU rules on date marking should be proposed by the end of 2022 within the framework of the Farm to Fork Strategy. A consumer research study is also being conducted within this framework. The study aims to better understand how consumers react to information on use by and best before dates.

## PROPOSITIONS OF ACTIONS

Working on date marking and product information might be more suitable for national authorities, especially if it addresses legal and sanitary considerations, and if major food producers and retailers are to be involved. However, regional authorities might also be able to play a role by working together with local producers and retailers or bring the attention of national food safety organisations on possibilities to reduce food waste by making date marking more consistent.

### BRINGING TOGETHER STAKEHOLDERS

It is wise to seek to directly involve federations or producers/distributors in the drafting of guides and for the implementation of specific actions, in order to take into account their constraints, inform them and raise their awareness of household waste, and co-construct adapted good practices. In addition, involving the health authorities will ensure the validity of the recommendations from a "food safety" point of view.

In addition, it is useful to identify the main causes of waste for the different types of products, the associated quantities, and to define with the different stakeholders the means to reduce it (formulation, visual communication, packaging design, etc.). Presenting evidence on the impact of date marking or of storage information on food waste generation can be a good way to initiate the participation of key stakeholders.

### ESTABLISH GUIDES ON BETTER FOOD LABELLING

To establish general recommendations on the use of the best-before and use by dates and on the information to be provided to consumers to ensure their proper use from a food safety and waste reduction perspective, it is useful to propose a clear and practical guide that lists best practices. These should clarify:

- The definitions and obligations related to the use-by date and best before date;
- The advice on storage information (refrigeration, freezing, etc.), and on see, feel, taste and test techniques to assess if a specific food product is still good beyond the use by date reported on the labelling;
- The labels and information formats in an effort to homogenise the information to consumers;
- Figures on the food waste resulting from lack of knowledge on how to correctly interpret food labelling.

The guide developed by WRAP<sup>15</sup> is quite interesting in this respect, and also proposes checklists and decision trees to clarify the recommendations.

If it is interesting to clarify the good practices in terms of information and presentation of dates on products, it is also advisable to work on more specific recommendations on certain key

<sup>15</sup> <https://wrap.org.uk/taking-action/food-drink/actions/date-labelling>

products. In particular, it could be interesting to focus on products with a high carbon footprint, such as meat or dairy products. Such guides have been developed by WRAP, providing advice on information (expiration dates, storage, freezing) and packaging (possibilities to open only part of the products and keep the others), but also information and data on consumer behaviours and waste.

## PILOT ACTION IN A RETAILER

It is interesting to test the recommendations during a pilot action in connection with a retailer or any voluntary food store. Some schemes focusing on a type of product could be tested (for instance change of formulation of the best-before date, information on freezing), with consumer survey upstream and downstream on the consideration of the best-before dates or storage information, and on the impact on waste.

These different pilot actions could allow to evaluate the concrete impact of the actions and to justify a generalisation of the good practices, or the extension of these good practices to other types of food.

## PROMOTE INTER-REGIONAL COOPERATION

It seems important to bring consistency on date marking practices at a national, or even European scale, since inconsistencies leads to misinterpretation and confusion from consumers. It is therefore strongly advised to work on this issue together with the other regions and the national authority.

### POTENTIAL INDICATORS FOR OBJECTIVES AND MONITORING

The main objective is to reduce the waste linked to a bad knowledge of the deadlines, but also to a lack of knowledge of the storage possibilities. Therefore, it seems interesting to follow:

- Households' knowledge of the difference and the meaning of "best before" and "use by" dates and associated terms;
- Knowledge and behaviour of good food storage practices, especially for "key" foods (meat, dairy products, etc.)
- Behaviours in terms of refrigeration and freezing
- Knowledge of logos (if implemented)
- The number of companies applying good practices.



## DETERMINE YOUR RESOURCES, OBJECTIVES, AND MONITORING

### ALLOCATE SUFFICIENT AND CONTINUOUS RESOURCES TO FOOD WASTE PREVENTION

While it is difficult to assess the amount of financial resources that need to be allocated to effectively reduce food waste, an analysis of the available data suggests that it is unlikely to envisage a significant reduction in waste without devoting sufficient resources for dedicated programs and actions in a continuous manner, over the medium term.

On average, the different elements identified regarding the resources allocated to strategies and campaigns on food waste indicate amounts in the range of 0.1 to 0.2 € per capita per year.

This means that for a 3-year program targeting a population of 100,000 people, public authorities or relevant organizations should seek an overall financial commitment of 30,000 to 60,000 EUR.

However, it is possible that these values are to be qualified according to the size of the territory considered; they seem to apply to larger territories (countries) for which economies of scale are possible.

Public authorities, however, often lack the availability of funds to run such kind of initiatives. To compensate for the lack of financial resources, two approaches can be considered:

- Collaboration with other regions, possibly in conjunction with national authorities, who are also working on the subject. This collaboration is desirable to address the key players of food production and distribution but could also be considered in terms of programming (i.e. definition of scope, data collection processes, data analysis) and operational costs related to communication and dissemination (development of targeted messages and awareness campaigns, production and dissemination of campaign results).
- An involvement of other stakeholders in contact with consumers (local producers, retailers, etc.).

**IT IS UNLIKELY**  
to envisage a significant  
reduction in waste  
**WITHOUT DEVOTING**  
**SUFFICIENT RESOURCES**  
for dedicated programs

**It is advisable to create**  
**SYNERGIES WITH OTHER**  
**CITIES OR REGIONS**  
for more impactful action

In addition, it is important to consider the strategy and the campaign in a long-term perspective, with continuous actions, highlights to be repeated each year, and more specific projects in parallel. Setting the strategy over a long period of time also makes it possible to set up an adequate follow-up and to measure the impact of the actions implemented, particularly on the adoption of prevention behaviours in a durable manner by households.

Bringing together a monitoring group composed of different representatives of the main stakeholders (municipalities, HoReCa, distribution, local producers, food industry) would ensure a participatory governance that could open up and new initiatives in terms of follow-up actions and complementary monitoring methods, in addition to securing the active contribution to food waste prevention of these different stakeholders.

It is also advisable to set up monitoring systems for the different actions, seeking to estimate at least the evolution of behaviours, and ideally the associated quantities avoided.

## OBJECTIVES AND MONITORING

It is difficult to suggest a quantitative target based on a comparison of the different strategies identified. Targets identified in other strategies are generally around 30% of avoidable food waste reduction over a decade. This was achieved by the Love Food Hate Waste campaign, even though contextual factors (such as the evolution of prices for food) might have played a role in the evolution, but it required a long-term strategy, and steady resources to be allocated.

As mentioned in the previous paragraph, it is very important to set up a monitoring system that will allow:

- To assess the effectiveness of the different actions implemented
- To estimate the impact of the strategy to fight against food waste
- To better interpret the changes observed in the composition analysis of waste

In addition to the proposed indicators and monitoring methods detailed for the three sections above, general monitoring methods can be proposed.

### ORGANISE REGULAR SURVEYS

Like what WRAP does, an annual survey could be used to monitor more generally the penetration of waste prevention actions in households, to identify obstacles, and to analyse trends (e.g., on consumption).

### DEFINE A CLASSIFICATION OF PREVENTION BEHAVIOURS

In order to guarantee a homogeneous follow-up of the different actions on behaviours, it could be useful to define different categories of prevention behaviours (such as meal planning, leftover preparation, etc.) whose implementation could be monitored in a consistent way from one project to another. By inviting different projects and initiatives to use this classification, it should be easier to track changes in behaviour.

### SEEK TO MEASURE RESULTS DIRECTLY RELATED TO THE ACTION

If the action is aimed at changing behaviour on specific actions, it is preferable to measure changes in the number of people adopting these actions, rather than seeking to quantify impacts through waste composition analysis (as effects cannot be measured with sufficient precision over a short time frame or due to other external factors). Similarly, it may be useful to seek to gather more qualitative information on household perceptions of the action (through surveys, focus groups, etc.), in order to better identify the strengths and weaknesses of the action.

### ESTIMATE THE IMPACT OF THE DIFFERENT PREVENTION ACTIONS

Depending on possible individual data collected during food measurement operations, or by analysing the available data, it could be interesting to associate different categories of prevention behaviours with quantities avoided, which would make it possible to "translate" the evolution of behaviours into avoided quantities.

**AROUND  
30%  
OF AVOIDABLE  
FOOD WASTE REDUCTION  
OVER A DECADE**

**targets identified in  
several strategies**

## COMPOSITION ANALYSIS

It will be necessary to better define what is considered food waste and what is avoidable waste, possibly by proposing an exhaustive list of the different categories; it could also be interesting to conduct a more in-depth analysis at regular intervals (every 2 or 3 years), for example focusing on a particular type of product (depending on the actions implemented). In addition to residual waste, it is necessary to consider the characterisation of food waste separately collected from the moment when the coverage of the collection is significant, in order to be able to estimate the wasted quantities in both streams (and possibly extrapolate these data to the quantities composted at home and in collective composts).

## COMPARE SURVEY DATA WITH THE EVOLUTION OF AVOIDABLE FOOD WASTE QUANTITIES

These can be identified with composition analyses to see if they provide consistent information.

It could be useful to clarify these different monitoring elements, to record them in a document, and to make it available to the different stakeholders in charge of actions against food waste (survey institutes, organizations carrying out the characterizations, project leaders, etc.). It is important to define the monitoring modalities before the implementation of actions, in order to establish a possible "zero state", but also to foresee the collection of the necessary information before the action.

## MONITORING AND OUTLOOK

Various initiatives are underway to better identify effective actions that will lead to a significant reduction in household food waste. Some examples of these initiatives are:

- The "Dialogue Forum Private Household" led by Ecologic in the framework of the German campaign "Zu gut für die Tonne"<sup>16</sup>: this project aims to identify promising approaches and interventions in terms of reducing household food waste, based on a standardized monitoring method and an overview of international actions.
- The "European Consumer Food Waste Forum"<sup>17</sup> piloted by the JRC and DG SANTE will also help identify effective actions and quantify their impact. The results are expected in the first half of 2023.

Some other actions are being set up to help authorities and organization to measure food waste, such as FAO's Technical Platform on the Measurement and Reduction of Food Losses and Food Waste.

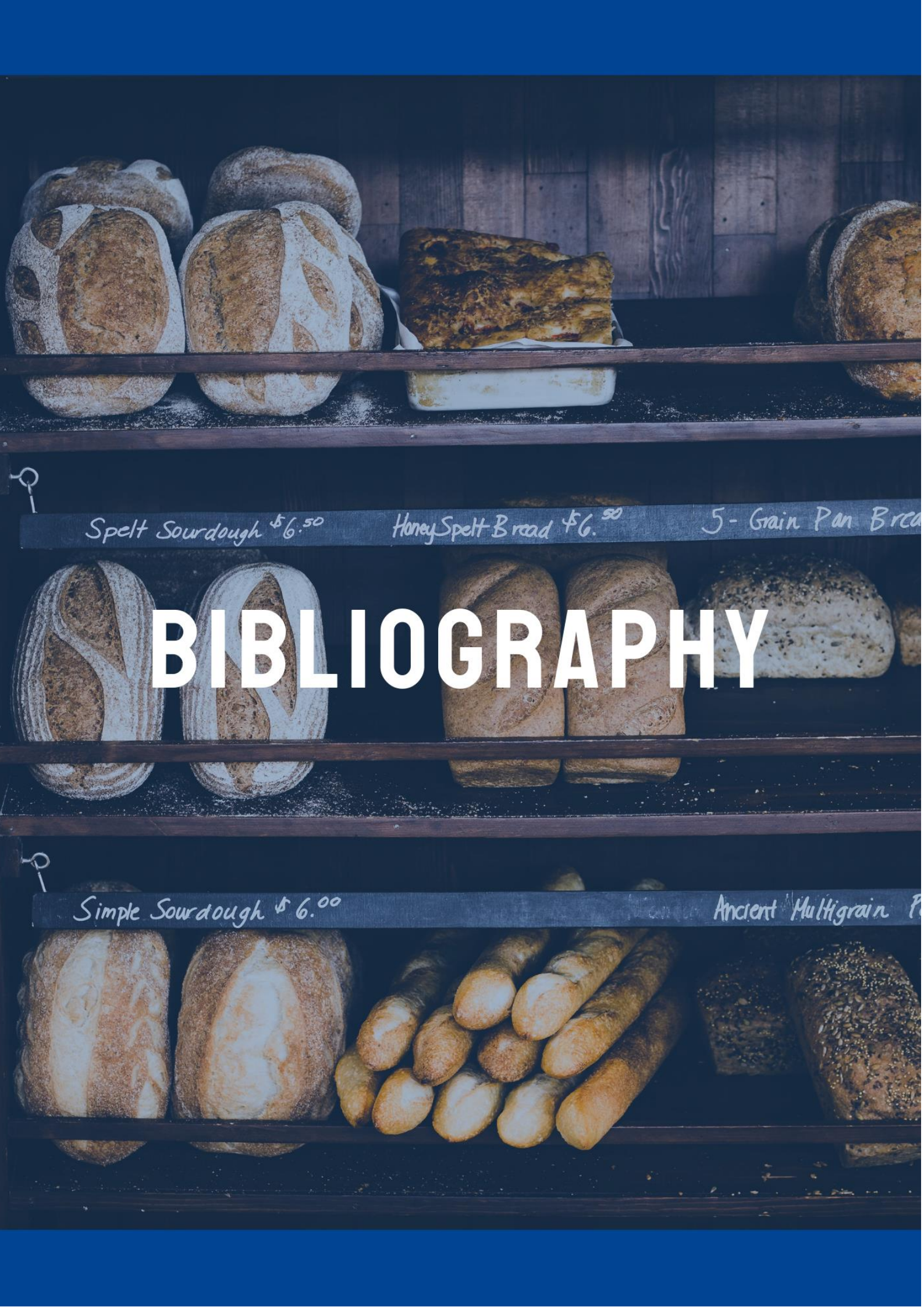
In addition, the harmonization of food waste monitoring should allow for better comparisons of the different initiatives and produce more comparable quantitative data.

ACR+ will be able to monitor the development of the different strategies implemented by its members and will investigate possibilities to consolidate benchmarking of food waste prevention initiatives.

<sup>16</sup> <https://www.ecologic.eu/17654>

<sup>17</sup> [https://knowledge4policy.ec.europa.eu/projects-activities/european-consumer-food-waste-forum\\_en](https://knowledge4policy.ec.europa.eu/projects-activities/european-consumer-food-waste-forum_en)





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