



REFRESH Policy Brief: Reducing consumer food waste

Key Messages

- Policy interventions that increase the skills of consumers for food management are likely to have an impact. Campaigns though, that exclusively provide information and increase awareness about the negative impacts of food waste do not seem to have an influence.
- Policy makers should implement campaigns that aim to influence social norms. Social norm campaigns are impactful as they exploit the tendency of individuals to conform to what they perceive those around them do.
- Policy makers should consider interventions based on regulation, economic instruments and nudging approaches.
- Interventions need to be monitored and evaluated to gain insights about the effectiveness and allow for adjustments.
- An integrated approach to food waste reduction/ food policy is needed, e.g. related to health policies, the economic framework, resource efficiency and waste policies.



1 Enacting policy to drive food waste reduction

Consumer behaviour as a key REFRESH policy area for food waste reduction

With an estimated contribution of 53%, the consumer is the primary contributor to food waste across the food chain in higher income countries (Stenmarck et al. 2016). Considering that a large amount of this waste could be avoided, the urgent need to change consumer behaviour is evident. Reducing consumer food waste and policy interventions to support this effort is therefore a key area of the EU project REFRESH within which this report was developed.

This policy brief outlines how to reduce consumer food waste through policy interventions.

Reducing food waste in Europe through REFRESH research

The EU project REFRESH (Resource Efficient dRink for the Entire Supply cHain) is a four-year (2015-2019) Horizon 2020 EU research project taking action towards food waste reduction. This project's goal is to support the Sustainable Development Goal 12.3¹ of halving per capita food waste at the retail and consumer level, reducing food losses along production and supply chains, reducing waste management costs, and maximizing the value from unavoidable food waste. Furthermore, the project promotes the consideration of the food use hierarchy which prioritises prevention, followed by redistribution for human, then animal consumption, before other forms of valorisation (composting, bio-energy, etc.)

Three policy areas stood out as primary focuses for which REFRESH has the most impact for food waste reduction through its evidence-based research. Policy briefs have therefore been developed for these: Animal Feed, Consumer behaviour, and integrated supply chain policies (comprising Voluntary Agreements and Unfair Trading Practices).

¹"cutting in half per capita global food waste at the retail and consumer level, and reducing food losses along production and supply chains (including post-harvest losses) by 2030"

2 Influencing factors of consumer behaviour

The factors that cause consumers to waste food are complex. Often food waste is a result of conflicting goals, such as convenience, taste, and saving money. Consumer food waste behaviour is determined by consumers'

- **Motivation** (including attitude, problem awareness, and social norms around wasting food),
- **Opportunity** (including time availability, access to technologies, and having the quality and quantity of food), and
- **Ability** (skills and knowledge) to control or change food waste-related behaviour.

Socio-demographic aspects such as age, gender, income and household size are also correlated with food waste as they influence motivation, ability and/or opportunity, but do not play a causal role.

REFRESH results of a survey in four countries with 3354 households shows that the awareness of the consequences of wasting food was not correlated with food waste levels, meaning that it did not show a significant influence (van Geffen et al. 2017).

Social norms though have a clear influence, i.e. the more strongly consumers believe that others such as family members and friends waste food, the more food they waste themselves. Also, "busy lifestyles" and the prevalence of unforeseen events strongly influences food waste levels: Consumers who more often encounter unforeseen changes in their schedule tend to waste more food.

It also shows that households with less food waste tend to exhibit five household food management practices: planning of food shopping and use, less impulse buying, maintaining overview of the food in stock, precisely determining the amounts of food when cooking, and using leftovers.

3 Policy instruments to influence consumer food waste

Policy instruments that exist to influence consumer food waste can be clustered into five categories:

- **Information** and awareness raising campaigns²
- **Regulation**
- **Economic instruments**
- **Nudging**/change of consumer's choice architecture and
- **Voluntary Agreements.**

These instruments are often used in combination. Within the EU, the most often used instrument so far is public campaigns that have been designed to provide information that increases awareness on the negative impacts of food waste. However, there are only very few studies that have evaluated the extent to which these activities actually reduced or prevented food waste. Meta-analysis of pro-environmental behaviour experiments though have shown that intervention strategies that only provide information are the least successful (Osbaldiston and Schott 2012). Therefore, the common assumption that providing information is sufficient to induce behavioural change is not supported by the evidence. REFRESH research (see section 2 above) that analysed influencing factors for consumer food waste came to similar conclusions.

Policy makers should consider interventions based on regulation, economic instruments and nudging approaches. Where necessary, these approaches should be supported by carefully designed campaigns drawing on the latest insights from research.

More information how EU and national policy makers can influence consumer food waste can be found in the REFRESH background report "Policies against consumer food waste: Policy options for behaviour change including public campaigns" (Wunder et al. 2019) accompanying this policy brief.

² Information covers all attempts by public policy makers to influence people through the transfer of knowledge, education and counselling. It includes everything based on argumentation and persuasion. Thus, it covers information and awareness campaigns, social norm campaigns, educational efforts and skill training, prompts and labelling, feedback, self-commitment and ICT tools as crosscutting category.

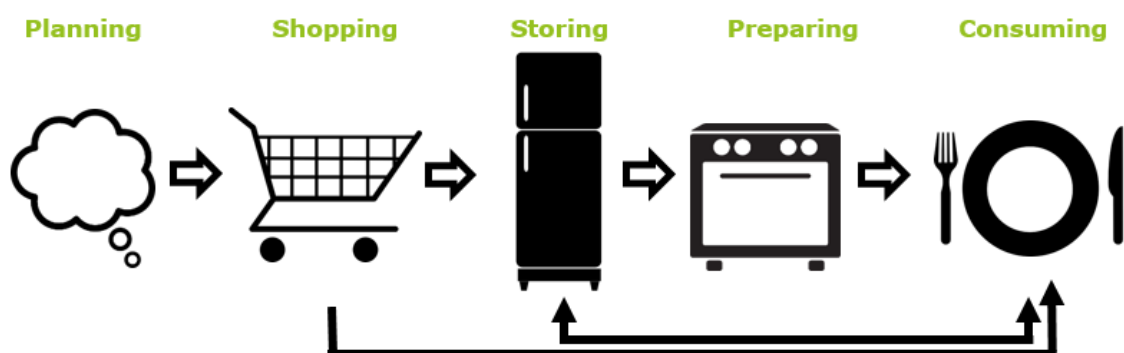
3.1 Social norm campaigns

Research suggests that it could be helpful to design, implement and test campaigns that aim to influence social norms. Social norm campaigns exploit the tendency of individuals to conform to what they perceive those around them think or do. Therefore, there is an opportunity to shape behaviour by giving people information about the behaviour or attitudes of others in the population, carefully selected to maximise adoption of positive behaviours. When (re)designing campaigns, policy makers should also consider using positive rather than negative messages, as research has shown messages that blame consumers for waste tend to have backfiring effects.

3.2 Education and provision of skills

The provision of practical skills aimed at consumers should be stronger in the focus of policy interventions. These need to build on an analysis of national particularities (e.g. which food items are wasted most and why) and key target groups (e.g. young people), and be **tailored to existing knowledge** and skills to influence the most relevant household food management practices.

Figure 1: Food management practices with an impact on consumer food waste



Source: Wunder et al. (2019)

Education interventions including skill development can be set out via regulation, be it for schools, university curricula or job training (e.g. curricula for cook's education).

3.3 Feedback, prompts and personal commitments

Interventions that are not yet used very often, but can drive changes in consumer behaviour and should be tested are feedback, prompts and personal commitments.

- 1 **Feedback** refers to providing information about the frequency and/or consequences of a target behaviour, in this case the amount of food

wasted. Feedback can be individual (e.g. a printed sheet of one week's food waste amount per household) or done in comparison to others.

- 2 **Prompts** are verbal or written messages that remind people on a desired behaviour, e.g. a sign at a buffet in a canteen "Come back as often as you want" or an on pack information: "Store me in the fridge".
- 3 **Commitment** is giving a pledge to change behaviour, asking people to agree to perform a target behaviour. Signing pledges or promise cards increases the likelihood of a person performing the behaviour to which they have committed and can be linked back to people's desire to behave, and appear to behave, consistently. There have been some examples³ in the form of an online pledge to reduce food waste, though yet without an evaluation. General consumer behaviour literature suggests that commitment works best when public (e.g. pledges posted online).

3.4 Regulation

There are relatively few ways to directly impact consumer food waste levels through regulation. Examples include regulation on **date marking**, **requirements for packaging**, or **prohibition for certain practices** (e.g. potential bans on "Buy one get one free" promotions).

Consumer food waste is often at the center of interventions and media attention. However, food waste reduction needs to be addressed all along the supply chain, starting from primary production. Other actors in the food chain, particularly retail and hospitality have significant influence on consumer behaviour and therefore also need to be involved in public strategies addressing consumer food waste.

Also, **education** activities (see section 2.2) can be required through regulation, as e.g. done through both the Italian food waste law (Law 166/2016) and the French food waste law (Law 2016-138)⁴.

There are also other areas for regulation that do not directly target consumers but can **indirectly reduce consumer food waste** and/or which depend on changed consumer behaviour. This includes:

- **Relaxing marketing standards:** marketing standards about size, colour, shape etc. of fruits and vegetables are often highlighted as a source of food waste for fresh produce. Evidence on the amounts of waste and savings potential associated with marketing standards is though mostly anecdotal.

³ by the NGO "feedback" and as part of the Australian "FoodWise" campaign

⁴ Article 9 of the Italian so-called "Gadda law" requires food waste education on public media, through ministry activities, and in school and university curricula. It also enables regions and cities to run campaigns about food waste. The French Law (Art 3) amends the education law requiring that food waste education be provided in schools.

- **Increasing availability of new products from surplus food:** One barrier to consumption of products made from surplus food and secondary resources is low supply due to the administrative burden of bringing novel food products to market (e.g. soda from coffee cherries or products made from insects fed on food waste). Since 2018 the new Novel Foods Regulation (Regulation (EU) 2015/2283) addresses this problem to some degree.
- **Prohibition for supermarkets to waste edible food:** The obligation for supermarkets in France with a surface area of over 400m² to establish contracts with charitable organisations to which they must donate their food surplus⁵ has received extensive media coverage. Although it does not directly reduce food waste on the consumer level, it is a measure with indirect effects on consumers (availability of discounted food, etc.).
- **Requirements within public procurement regulation:** The set-up of (green) public procurement rules, for food provision in e.g. hospitals, school, and public canteens, can be influenced by public policy. Standards can be set e.g. related to the size portions, staff training or availability of dishes during daytime – all having an impact on food waste and providing consumers with the opportunity to reduce food waste.
- **Regulation on waste collection and recycling:** Waste regulation, requirements for separate waste collection, potentially combined with fees (“pay as you throw”) and recycling of (organic waste) can have an influence on how much consumers waste and what happens to consumer food waste.

3.5 Economic instruments

Only few public approaches are known in which **fees and taxes** are used to reduce food waste (e.g. incentives for donating food in Italy, penalties for supermarkets wasting food in France) and research about their impact is lacking. The **price of food** though and its share in household income plays already a role for food waste behaviour in general. Low prices for food in relation to income are seen as a reason for overconsumption and food waste.

At the same time, extensive research has illustrated that if the real cost of natural resource use and the costs of food waste for the society is reflected in prices (i.e. **internalize external costs**), food prices would need to grow (Willet et al 2019, Sustainable Food Trust 2017). This would in turn provide economic incentives for food waste prevention.

⁵ This obligation is outlined in n°2016-138 Law: fighting against food waste (LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire) adopted by the French National Assembly.

3.6 Nudging

The **modification of choice architecture** - also called "**nudging**" - in selecting, processing and disposing (food) waste can be used as a strategy to reduce food waste. Nudging influences behaviour through automatic cognitive processes ("mental shortcuts") in favour of the desired outcome, i.e. they are "gently pushing" consumers in the favoured direction **without forcing** them. Nudges are a response to the so called "intention-behaviour gap". Within the domain of consumer food waste the application of nudges has just started. Nudges such as changes to **plate type and size** as well as **portion size and availability of trays** have led to reduced food waste. Learnings from healthy food nudges can be used for decisions about **placing** certain food products in more visible and salient places. Nudging can be particularly powerful to reduce out-of home food waste and is therefore relevant for canteens, caterers, restaurants etc. As public policy makers also shape the **food procurement** of hospitals, schools, prisons etc. nudging is an important element to be considered.

Nudging: modifying the choice architecture

Application of nudges to change consumer food waste (e.g. plate size, portion size, placing) also in combination with prompts ("come back twice") have just started. They are a promising intervention, e.g. to be used in public canteens.

3.7 Strategies and Voluntary Agreements

In the area of food waste, collaboration across the supply chain can play a big role. The starting point is that interactions across the food supply chain are generally based on contracts, not on cooperation, and food waste prevention is rarely considered in such contracts. Addressing this requires a different approach, and voluntary cooperation may be one option for doing so. Voluntary Agreements are self-determined commitments or pacts with qualitative and quantitative objectives, developed by private entities and/or other stakeholders in consultation with their signatories. They are used as alternative courses of action to traditional legislation, can be piloted by government officials, businesses or other actors, and can be used in addition to, or independently from existing legislation (Burgos, Colin, Graf, Mahon, 2019).

A large part of the REFRESH project has focused on facilitating and analysing Voluntary Agreements (Osoro and Bygrave 2016, Piras et al. 2018). It has shown that among the **main success factors is having government backing**, including but not limited to financial support. More information on the impact of Voluntary Agreements on food waste is found in the REFRESH policy brief "Voluntary Agreements as a collaborative solution for food waste reduction" (Burgos et al. 2019).

Agreements made within these processes have an **indirect influence on consumers** and consumer food waste levels, e.g. through relaxed marketing standards for fruits and vegetables, agreements for on-pack

information, requirements for high diversity in bread shelves, reduction/ban on buy one get one free promotions, food donation etc.

4 Evaluation of interventions

Though there have been many interventions, there are only very few studies that have evaluated to what extent these activities actually reduced or prevented food waste. This lack of evidence about how effective different interventions are at preventing consumer food waste makes it difficult for policy makers to make evidence-based decisions.

The lack of research surrounding food waste reduction interventions is worrying as researchers as well as policy makers continue to propose, fund and implement approaches to reduce food waste, although there is very little reproducible quantified evidence to assure success or long-term effectiveness. Also, the few examples follow different assessment methodologies, so their results are not comparable.

Future research and resources are needed to test and evaluate interventions. Most importantly, monitoring and evaluation needs to be considered early in the process: i.e. developed at the same time as the planning for the intervention themselves. All too often, evaluation is only considered towards the end of the implementation phase, which is usually too late for effective evaluation.

Evaluation can help decide whether an intervention needs stopping if it is ineffectual, altering to increase its effectiveness, or rolling out more widely if it is working well.

Within REFRESH, a detailed guidance document to evaluate household food waste interventions has been published in February 2019 (Quested 2019).

5 Integrated policies to reduce consumer food waste

Reducing food waste is an important international objective and for that reason also a central part of the global sustainable development agenda (SDG 12.3). However, the generation of food waste is not the only problem in the current global food system, nor is the only problem that is related to food and consumers.

Food systems are closely linked with **health impacts**, with 1.5 billion people being overweight (WHO 2017) and 795 million people undernourished globally (FAO 2015) In Europe, and many other countries with “western diets” consumption of meat and other animal proteins is above a healthy level and causes significant health impacts.

Consumer demand is also connected with **ecosystem health** and the **agricultural production system**: According to UNEP (2016) global food systems are estimated to be responsible for a third of degraded soils, a quarter of greenhouse gas emissions and 60% of terrestrial biodiversity

loss. The concentration on only a few crops in the global food systems also makes the food system less resilient to climate change and other challenges.

Many argue that the magnitude of the food waste problem is to a large degree a **symptom of a dysfunctional food system**. Policies against food waste therefore also need to look for synergies to achieve a more general **shift towards a more sustainable and resilient food system**.

An EU Food Policy is needed to increase the overall coherence of policy interventions.

6 Recommended reads on reducing consumer food waste

More information how EU and national policy makers can influence consumer food waste can be found in the REFRESH background report "Policies against consumer food waste: Policy options for behaviour change including public campaigns" (Wunder et al. 2019) accompanying this policy brief. Further insights on consumer food waste behaviour and REFRESH research results is summarized in van Geffen et al (2017). A good overview how to set up monitoring of policy interventions and ensure effectiveness of interventions is summarized in Qusted (2019).

7 References

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