

Tackling food waste

The EU's contribution to a global issue

SUMMARY

In spite of the availability of food, there is still malnutrition in the world. Food is lost or wasted throughout the supply chain, from initial agricultural production down to final consumers. In developed countries, a significant amount of food is wasted at the consumption stage, meaning that it is discarded even though still suitable for human consumption. In developing countries food is lost mostly at the farmer-producer end of the food supply chain; much less food is wasted at consumer level.

Experts assert that the largest part of food waste in developed countries is produced by households and is linked mainly to urbanisation, changes in the composition of diets, and large-scale mass distribution.

Overall, on a per-capita basis, much more food is wasted in the industrialised world than in developing countries. In the EU, food waste has been estimated at some 89 million tonnes, or 180 kg per capita per year.

Food losses and waste have negative environmental and economic impacts and their existence raises questions for society. The EU is contributing to reducing food waste mainly through its commitment to halve the disposal of edible food in the EU by 2020. Various national initiatives also aim to attain this goal. The European Parliament has called for 2014 to be designated as 'European year against food waste'.



In this briefing:

- Background
- Food waste: features and causes
- Food waste in the EU
- The impact of food waste
- Limiting food waste in the EU

Background

Food is essential to life. Yet, there are nearly 1 billion malnourished people in the world. Each year, about 4 billion metric tonnes of food are produced, but due to poor practice in harvesting, storage and transport, as well as market and consumer wastage, [30-50%](#) of it (or 1.2-2 billion tonnes) is [wasted](#).

Experts [argue](#) that access to food will be even more difficult for the poor in future, due in particular to price volatility, access constraints, the interdependence of commodity markets, and the impact of climate change on food production systems.

Feeding a [projected](#) population of 9.6 billion people by 2050 will be an unprecedented challenge for humankind and will [require](#) a multifaceted and integrated global strategy. Increasing food production is only one among many ways to meet this challenge. [Researchers](#) argue that one strategy to improve food availability would be simply to reduce waste. This, in turn, could help moderate the need for increased food production to meet growing food demand, which would alleviate the pressure on resources and help lower [greenhouse gas emissions](#) (for which the EU has made a [commitment](#) of a 20% reduction by 2020 compared to 1990 levels).

Food waste: features and causes

A possible definition

There is no single definition of food waste, in either public policy or scientific communities. The Food and Agriculture Organisation (FAO) [distinguishes](#) between food losses and food waste¹. Food losses refer to losses that occur upstream of the [food supply chain](#), mainly during sowing, cultivation, harvesting, processing, preserving, and the first agricultural transformation stages. Food losses resulting from negligence of retailers or consumers, or a conscious decision by them to throw edible food away at the end of the food chain are usually called food waste.

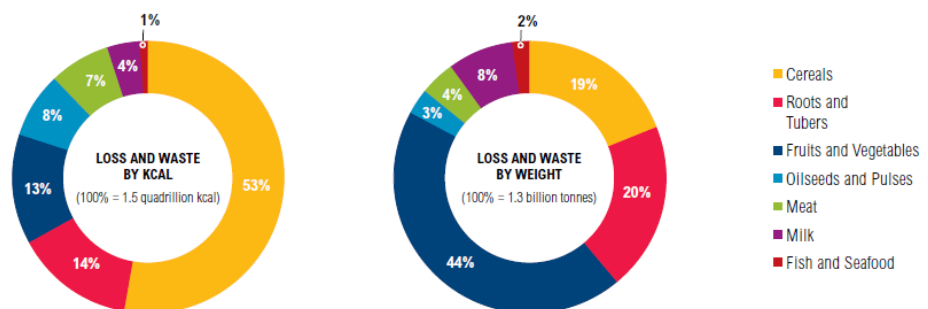
FAO data are based on weight. In weight terms, a tonne of grain is the same as a tonne of fruit, or a tonne of meat. However, experts [warn](#) that food types vary widely in terms of their [water and caloric content per kilogram](#) (kcal/kg, see figure 1). For instance, a kilogram of wheat flour on average contains 3 643 kcal (12% water) whereas a kilogram of apples on average contains 587 kcal (84% water). Consequently, it is worth noting that measuring by weight does not consistently reflect the energy in food products that could have been consumed by people, but in most cases these are the only data available.

Patterns of occurrence

Experts [identified](#) three main population groups across the world – based on characteristics associated with economic development – where food waste occurs.

In *late-stage developing* nations that are

Figure 1 - Share of global food loss and waste by commodity, 2009



Data source: Reducing food loss and waste, [World Resources Institute](#), 2013.

currently industrialising rapidly, (e.g. China) and in **newly developing** countries that are beginning to industrialise, (i.e. mainly in Africa) wastage tends to occur primarily at the farmer-producer end of the supply chain, due to weather and soil conditions, weeds, pests, bacteria and storage.

In **fully developed**, post-industrial societies, such as those in Europe, more-efficient farming practices and better transport, storage and processing facilities allow a larger proportion of the food produced to reach markets and consumers.

Regionally, about 56% of total food loss and waste occurs in developed countries (e.g. North America, Oceania, Europe, and the industrialised Asian nations of China, Japan, and South Korea) while developing countries account for 44% of losses (see figure 2).

On a per capita basis, however, North America and Oceania (1 520 kcal per person per day) total twice as much as Europe (748 kcal) or industrialised Asia (746 kcal).

Main causes at consumer level

Experts [assert](#) that the largest part of food waste in developed countries is produced by households and is spurred by three [global trends](#). The most important of these is **urbanisation**, which has resulted in the gradual extension of the supply chain in order to satisfy the food requirements of city dwellers.

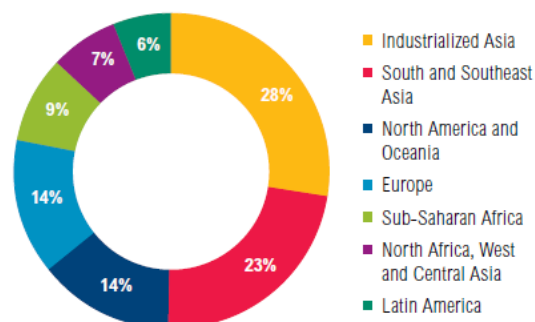
Increasing remoteness between the place of production and that of final consumption requires food to be transported greater distances, with the consequent need to improve transport, storage, and sale infrastructure to avoid additional losses.

The second element is **changes in the composition of diets**, linked to the increase in disposable income. This is particularly the case for economies in transition such as Brazil, Russia, India, and China, and involves a shift from starchy diets to diets increasingly consisting of meat², fish, and fresh produce, such as fruits and vegetables, all of which perish more quickly.

The third element consists of the **increasing globalisation of commerce** and the rapid diffusion of **large-scale mass distribution** in many emerging countries. Supermarkets have become the dominant intermediaries between farmers and consumers, replacing traditional retailers in many countries in Africa, Asia, and South America, and enabling greater diversification of diets. In addition, the need for higher quality products and safety standards for consumers and the increase in the volume of food products marketed, have an impact on the levels of waste generated.

Finally, a number of characteristics associated with modern consumer culture also account for food wasted through retail practices (i.e. precise aesthetic standards for the size and appearance of fruit and vegetables, see box)³ and customer behaviour⁴ (i.e. preparation of over-generous portions, purchase of excessive quantities induced by sales promotions, and use of confusing wording for expiry dates⁵).

Figure 2 - Share of global food loss and waste, (100% = 1.5 quadrillion kcal)



Data source: Reducing food loss and waste, [World Resources Institute](#), 2013.

Note: Number does not sum to 100 due to rounding.

Food waste for aesthetic reasons

In his [book](#), *Waste - Uncovering the Global Food Scandal* (2009), Tristram Stuart [reveals](#) that every day, an average of 13 000 slices of bread are wasted by suppliers of sandwiches because the standards imposed by the British distribution chain Marks & Spencer specify that the end slices and the crusts of sandwich loaves should not be used. This results in the waste of approximately 17% of the raw material. The author also explains that one of the major suppliers of the British supermarket chain ASDA rejects 25-30% of all carrots processed and sets them aside for animal feed. About half of these are rejected due to wrong shape or size; the other half is rejected for being broken or having clefts or blemishes.

Food waste in the EU

In the EU, food waste along the supply chain has been [estimated](#) at approximately 89 million tonnes or 180 kg per capita per year, and is [expected](#) to rise to about 126 million tonnes a year by 2020, unless action is taken. Households produce the largest share of EU food waste (42%), followed by agriculture/ food processing (39%), food service/catering (14%), and retail/wholesale (5%). The average per capita waste level obscures high variation amongst Member States (see figure 3).

According to a recent [study](#) (2013), the highest food waste generators, expressed as kg per capita are the Netherlands (541 kg), Belgium (345 kg), Cyprus (327 kg) and Estonia (265 kg); the lowest are Slovenia (72 kg), Malta and Romania (both 76 kg), followed by Greece (80 kg) and the Czech Republic (81 kg). Overall, the EU-15 countries tend to waste more food per capita than the EU-12 countries.

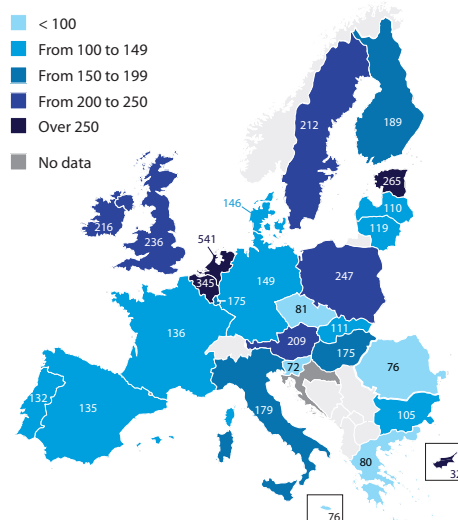
Analysis from the same source suggests that total estimated food waste has been steadily diminishing in recent years, falling by 23% from 2004 to 2010. However, over the same period, the amount of potential food waste generated (per capita) by households appears to have been growing, increasing by nearly 58% between 2004 and 2010 (see table 4).

Table 4: Variation in food waste, EU-27, 2004-2010

Year	Household food waste, kg/capita	Total food waste, kg/capita	Total, million tonnes
2010	52	184	92.2
2008	48	195	96.9
2006	43	235	116.2
2004	33	240	117.5

Source: [Technology options for feeding 10 billion people](#), STOA 2013.

Figure 3 - Estimated total food waste in the EU, 2010 (kg per capita)



Data source: [Technology options for feeding 10 billion people](#), STOA 2013.

The impact of food waste

Food loss and waste have negative environmental and economic [impacts](#), and their existence raises questions for society (see figure 5).

Environment

Throwing food away means energy, water and land having been consumed to no avail. And in addition to the waste of resources, there are also the consequences of having to manage a large quantity of waste, part of which could have been avoided.

To illustrate the extent of the wastage of resources, energy, and money associated with food waste, in 2011 American researchers [analysed](#) tomato supplies. They observed that about 377 000 tonnes of tomatoes were lost or wasted along the supply chain in the United States in 2008. This amount of tomatoes is equivalent to having unnecessarily consumed about 90 square kilometres of land and 57 billion litres of water, and having wasted an average of 7 million working hours. Disposal of the tomatoes thrown away cost about €12.3 million, and caused 312 000 tonnes of greenhouse gas emissions. According to the study's authors, avoiding wasting these tomatoes would have reduced greenhouse gas emissions by an amount equal to that obtained by taking 55 000 cars off the road for one year.

The production and disposal of EU food waste (89 million tonnes) [leads](#) to the emission of 170 million tonnes of CO₂ and consumes 261 million tonnes of resources.

Experts [estimate](#) that reducing food waste at consumer level in developed countries by 30% could save roughly 400 000 square kilometres of cropland by 2030.

Economy

Food loss and waste represent fruitless investment, which can reduce farmers' incomes and increase consumers' costs. For example, food waste at the consumption stage [costs](#) an average of €1 160 per year for a family of four in the United States, and €797 per year for the average household in the United Kingdom. Annually, over €23 billion worth of food is thrown away in China. In sub-Saharan Africa, where many farmers earn less than €1.50 a day, post-harvest losses are valued at up to €3 billion per year.

Experts [estimate](#) the total benefit to society of reducing food waste to be €183 billion globally in 2030. However, they stress that ensuring global food security is a complex task and will require more than just reducing food waste, including addressing the issues of income distribution and dietary preference.

Society

On a global scale, farmers are able to [produce](#) the equivalent of 4 600 kcal per capita per day, of which only 2 000 kcal are actually consumed. [Research](#) (2011) shows that the quantity of food wasted at consumer level in industrialised countries (222 million tonnes) is nearly equal to food production in all sub-Saharan Africa (230 million tonnes).

Figure 5 - Environmental impact of food waste



Data source: BCFN, [Defeating the paradox of food waste](#), 2013

The role of women in reducing food loss and waste

Experts [argue](#) that women play an important role in reducing food waste in both developing and industrialised countries since they interact with food at each stage of the value chain. At the farm, women represent 41% of the agricultural workforce in the world and form the majority of agricultural workers in South Asia and sub-Saharan Africa. At home, women are responsible for 85-90% of the time spent on household food preparation. Researchers [stress](#) that the increasing employment of women also has an impact on food handling. Multiple burdens due to work and family reduce the time available for daily shopping. Thus, larger quantities are bought to last a whole week, increasing the probability that some food items will be wasted.

In spite of the availability of food, malnutrition continues to be found in the world. The reason for this resides mainly in the high levels of poverty and/or the presence of conflicts in particular countries or regions. Experts [claim](#) that there is a strong correlation between areas with high percentages of extremely poor people, dry climate and poor availability of water, and high malnutrition levels. Activists [assert](#) that less waste means less drain on resources in the producer countries and less upward pressure on prices.

Limiting food waste in the EU

The EU is contributing to reducing food waste in a number of ways. In its [Roadmap to a Resource-efficient Europe](#) (2011), the European Commission (EC) set the target of halving disposal of edible food in the EU by 2020. The roadmap states that the EC will assess how best to limit waste throughout the food supply chain, via a Communication on Sustainable Food due to have been published by the end of 2013.

Under the [Waste Framework Directive](#), Member States were required to develop waste prevention plans by 2013. As part of these plans Member States should set mandatory reduction targets for food waste.

The Commission has also developed a [website](#) providing information on the causes of food waste, tips for preventing it, and data on the quantity and impacts of food waste in the EU and globally. The EU-funded project [FUSIONS](#) will establish a European Multi-Stakeholder Platform to generate a shared vision to prevent food loss and waste across the supply chain. In January 2013 the EC announced a [Retail Action Plan](#) which would support actions to reduce food waste, and work on developing a long-term policy on food waste.

At **national level** various public and private bodies are developing initiatives ranging from awareness-raising [campaigns](#) to concrete actions aimed at the reduction and/or recuperation of food products.

The UK-based non-profit organisation **WRAP** – [Waste & Resources Action Programme](#) - aims to save every year 3.2 million tonnes equivalent of CO₂ emissions, from the 'avoidable' waste of food and drinks by 2015. In order to reach this objective, WRAP works with manufacturers and distributors, offers consumers suggestions on how to

European Parliament

In a resolution adopted in January 2012, the EP called for urgent measures to halve food waste by 2025. Among the actions favoured by the EP were: introduction of food education courses, proper labelling and packaging, public procurement rules ensuring where possible that contracts are awarded to catering companies that use local produce and give away or redistribute leftover food. The EP also called for 2014 to be designated 'European year against food waste'.

reduce food waste, and promotes actions for food waste reduction in the hotel, tourist, and public administration sectors.

The **Feeding the 5 000 initiative**, held in London (UK) in 2009 and [2011](#), demonstrated it was possible to offer a free meal to 5 000 people, using only food that would otherwise have been discarded.

Last Minute Market is an Italian [project](#) addressing the recovery of food products, collecting surpluses from business and manufacturing activities, vegetables that were not harvested and remained in the fields, and ready-made meals recovered from the food service channel, such as schools and businesses.

The French National Association for the Development of Solidarity Groceries (**ANDES Association Nationale de Développement des Épiceries Solidaires**) was set up as a reaction to food waste and the growing number of needy people. The solidarity shops offer low-income consumers food products at about 10-20% less than their normal retail price. In 2011, ANDES recovered 1 289 tonnes of fresh fruit and vegetables from French wholesale markets.

Inspired by an independent [documentary](#), the German '**Food sharing' movement**, seeks to collect and offer excess food. Through its website, it connects people who have surplus food with people searching for food. The website informs about the location of '[food baskets](#)' and what is in them. Over 5 000 exchanges have already taken place.

Stop Wasting Food (Stop Spild Af Mad) is the largest private consumer [movement](#) in Denmark committed to stopping food waste. It inspired the retail chain Rema 1 000 to drop quantity discounts in its 200 stores and introduced 'doggy bags' in Danish restaurants. In collaboration with renowned Danish chefs, the movement produced a cookbook explaining how to reuse leftovers to cook new dishes.

The economic crisis and food waste in the EU

According to a [survey](#) conducted in October 2013, 73% of Italians have reduced their food waste due to the economic crisis. Among the measures taken were: shopping more wisely, reducing the quantity of food purchased, increasing the use of leftover products, and paying more attention to expiry dates. A similar [trend](#) is noticeable in the United Kingdom.

Endnotes

¹ This accounts for the diverging estimates of the volumes of food losses and waste from one source to the other.

² Much of the food production needed can be [traced](#) back to increased meat consumption, either the meat itself or the crops required to feed livestock. To produce animal products requires 4 to 40 times the calories that they provide in nutrition when eaten, mainly due to the crops consumed. If all of the crop production currently allocated to animal feed were directly consumed by humans, global food production would increase by some 2 billion tonnes and food calories would increase by 49%. This becomes more important when considering the projection that, barring any change in diets, worldwide meat consumption could increase 40% by 2050 (from a 2000 baseline).

³ Experts [argue](#) that in the UK only, retailers generate 1.6 million tonnes of food waste annually in this way.

⁴ It has been [estimated](#) that 30% to 50% of what has been bought in developed countries is thrown away by the purchaser.

⁵ The fact that many products bear two or more [dates](#) can create confusion: one date relates to the expiry of the period during which the merchandise can be displayed and sold ("sell by"), one indicates the period during which it should be consumed ("use by"), and still another the period during which the product will be optimal ("best by"). Researchers [argue](#) that ambiguous labelling is a major factor leading to food waste. In 2011, the UK Department for Environment, Food and Rural Affairs presented new [guidelines](#) for the use of labels, encouraging the use of either "best by" for canned food, snacks and cookies or "use by" for perishable foods (e.g. cheese, meat, eggs, etc).

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