

Food waste

A report by the the UK's Institution of Mechanical Engineers claims that as much as half of all the food produced in the world – equivalent to 2 billion tonnes – ends up as waste every year. The report lists various reasons for the food waste:

- Poor agricultural practices
- Inadequate infrastructure for transporting food
- Poor storage facilities
- Strict sell-by dates on supermarket food
- Buy-one-get-one free promotions on food in supermarkets
- Western consumer demand for food that appears perfect (i.e. free from deformities)



The report, [Global Food. Waste Not, Want Not](#), found that between 30% and 50% of the total amount of food produced around the world each year (ca. 4 billion tonnes) never makes it on to a plate: this amounts to 1.2–2 billion tonnes of food wasted.

Facts and figures about food waste

Up to half of the food that is bought in Europe and the US is thrown away by consumers.

In the UK, as much as 30% of vegetable crops are not harvested due to their failure to meet supermarkets' standards on appearance (i.e. nothing short of food that appears physically perfect will be sold).

In the UK, about 7 million tonnes (worth about £10.2 billion) of food is thrown away from homes every year. It is estimated that this costs the average household £480 a year which accumulates to £15,000–£24,000 over a lifetime. The average family in the UK spends 11% of its expenditure on food.

Ca. 550bn cubic meters of water is wasted globally in growing crops that never reach the consumer.

It takes 20–50 times the amount of water to produce 1kg of meat than 1kg of vegetables.

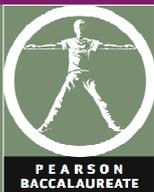
By 2050 we could need as much as 3.5 times the current total human use of fresh water to grow our food.

The report claims that there is the potential to provide 60–100% more food by cutting out waste while at the same time freeing up land, energy and water resources.

The nature of waste

LEDCs

In less-developed countries, such as those of sub-Saharan Africa and South-East Asia, wastage tends to occur primarily at the farmer-producer end of the supply chain. Inefficient harvesting, inadequate local transportation and poor infrastructure mean that produce is frequently handled inappropriately and stored under unsuitable farm site conditions.



Environmental Systems and Societies

As a result, bruising, mould and rodents destroy or at least degrade large quantities of food material, and substantial amounts of foodstuffs simply spill from badly maintained vehicles or are bruised as vehicles negotiate poorly maintained roads.

As the development level of a country increases, so the food loss problem generally moves further up the supply chain with deficiencies in regional and national infrastructure having the largest impact. In South-East Asian countries, for example, losses of rice range from 37% to 80% of the entire production, depending on development stage, and total about 180 million tonnes annually. In China, a country experiencing rapid development, the figure is about 45% whereas in less-developed Vietnam, rice losses between the field and the table can amount to 80% of production.

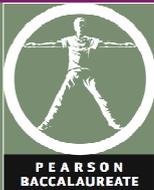
MEDCs

In MEDCs, consumerism, excess wealth and mass marketing lead to wastage. More-efficient farming practices and better transport, storage and processing facilities ensure that a larger proportion of the food produced reaches markets and consumers. However, characteristics associated with modern consumer culture mean produce is often wasted through retail and customer behaviour. Major supermarkets, in meeting consumer expectations, will often reject entire crops of perfectly edible fruit and vegetables at the farm because they do not meet exacting marketing standards for their physical characteristics, such as size and appearance. Globally, retailers generate 1.6 million tonnes of food waste annually in this way.

Overall, wastage rates in vegetables and fruit are considerably higher than for grains. In the UK, a recently published study has shown that 46% of potatoes grown is not delivered to the retail market. The details revealed that 6% was lost in the field, 12% was discarded on initial sorting, 5% was lost in store, 1% was lost in post-storage inspection and 22% was lost due to rejection after washing. A similar survey in India showed that at least 40% of all its fruit and vegetables is lost between grower and consumer due to lack of refrigerated transport, poor roads, inclement weather and corruption.

Of the produce that does appear in the supermarket, commonly used sales promotions frequently encourage customers to purchase excessive quantities which, in the case of perishable foodstuffs such as vegetable and fruit, inevitably generates wastage in the home. Overall between 30% and 50% of what has been bought in developed countries is thrown away by the purchaser.

Controlling and reducing the level of wastage is frequently beyond the capability of the individual farmer, distributor or consumer, since it depends on market philosophies, security of energy supply, quality of roads and the presence of transport hubs.



Better use of finite resources

Wasting food means losing not only life-supporting nourishment but also precious resources, including land, water and energy. These losses will be made worse by future population growth and dietary trends that are seeing a shift away from grain-based foods and towards consumption of animal products. As nations become more affluent in the coming decades through development, per capita calorific intake from meat consumption is set to rise 40% by mid-century. These products require significantly more resource to produce. As a global society therefore, tackling food waste will help contribute towards addressing a number of key resource issues:

Effective land usage

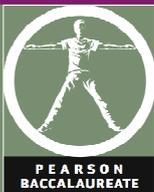
- Over the last five decades, improved farming techniques and technologies have helped to significantly increase crop yields.
- A further increase in farming area would impact unfavourably on natural ecosystems.
- Livestock farming demands extensive land use. One hectare of land can, for example, produce rice or potatoes for 19–22 people per annum, but the same area will only produce enough lamb or beef for one or two people.
- In terms of land-use, agricultural food production based on livestock is far less efficient than that based on crops, largely because only about 3% of the feed energy consumed by livestock remains in edible animal tissue.

Water usage

- Over the past century, fresh water abstraction for human use has increased at more than double the rate of population growth.
- Currently about 3.8 trillion m³ of water is used by humans per annum. About 70% of this is consumed by the global agriculture sector, and the level of use will continue to rise over the coming decades.
- The demand for water in food production could reach 10–13 trillion m³ annually by mid-century: 2.5 to 3.5 times greater than the total human use of fresh water today.
- About 550 billion m³ of water is wasted globally in growing crops that never reach the consumer.

Energy usage

- On average 7–10 calories of input are required to produce one calorie of food. This varies dramatically depending on crop, from three calories for plant crops to 35 calories in the production of beef.
- Since much of this energy comes from burning fossil fuels, food waste potentially contributes to unnecessary global warming.



Environmental Systems and Societies

- Fertilizers and pesticides are a big component of modern food production. Of all the energy needed to produce wheat, approx. 50% is needed to produce fertilizers and pesticides. Globally, fertilizer manufacturing consumes about 3–5% of the world's annual natural gas supply.
- Agriculture currently consumes approximately 3.1% of total global energy; this is divided into 2.5% in developed countries and 0.6% in developing countries.

Storage

- In many countries, grains including wheat, maize and rice are too damp for direct transfer to storage, so need to be dried.
- Drying large quantities of material requires substantial amounts of energy to be delivered through engineered infrastructure, particularly in the form of electricity or fossil fuels such as oil or gas.
- In Ghana there was a 50% loss rate in 2008 of stored maize from a total production of one million tonnes.
- In India, about 21 million tonnes of wheat annually perishes due to inadequate storage and distribution.
- In Pakistan, losses amount to about 16% of production, or 3.2 million tonnes annually, where inadequate storage infrastructure leads to widespread rodent infestation problems.
- In Ukraine there are 25–50% losses. Given typical grain production levels of about 24 million tonnes : this amounts to losses of some 6–12 million tonnes annually for that country alone.

Processing

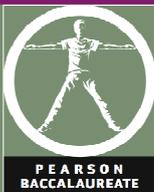
- Food processing uses large amounts of electricity and/or fossil fuels.
- A burger typically uses between three and eight times more energy in its production and distribution than it delivers to the consumer as food.

Waste at the marketplace

- In the open stalls, wastage rates are high. Rodents, insects and moulds are common. However, it is in the most 'advanced' and affluent societies where the largest quantities of food are wasted at the consumer end of the chain. Some 30% of what is harvested from the field never actually reaches the marketplace.
- The catering industry is believed to throw away a third of its food as restaurants deliberately order too much in order to avoid running out. Read [this article](#) about how restaurants can cut food waste.

Food for thought

Wasted food could be used to feed the world's growing population (estimated to peak at 9.5 billion by 2075) as well as those in hunger today. It is also unnecessarily wastes land, water and energy resources that are used in the production, processing and distribution of this food.



Environmental Systems and Societies

To prevent further waste, governments, development agencies and organizations such as the United Nations must work together to help change the way people view their food, to appreciate the waste that takes place, and discourage wasteful practices by farmers, food producers, supermarkets and consumers.

The potential to provide 60–100% more food by simply eliminating losses, while simultaneously freeing up land, energy and water resources for other uses, is an opportunity that should not be ignored.

Activities

1. Think about ways in which you can reduce food waste. Discuss these ideas within your class. Ideas for cutting food waste could include:
 - Make meals from leftover food (e.g. bubble-and-squeak from leftover vegetables; a roast chicken carcass makes great stock for risotto or soup the next day).
 - Think before you shop: have a look in the fridge for what you already have and have an idea of meals or recipe needs before you go shopping.
 - Use teabags and leftovers to form compost for your garden, to recycle nutrients.
 - If you have excess bread, use it to make panzanella, croutons or bread and butter pudding.
 - Use your freezer – if you know you are not going to use something, freeze it fresh for another day. A full refrigerator retains cold better than an empty one.
 - Store food carefully: get into the habit of putting cereal, biscuits, and fresh nuts into tins or airtight containers
 - Don't be a slave to the sell-by. Remember that best before dates may be over cautious. Often with non-meat or dairy products you can use your common sense to check if they're still good to eat.

Check out further ideas about how you can reduce your own food waste [here](#).

2. a) Carry out a survey in your school or college of food waste. Weigh the food wasted in one day. Alternatively work out the average amount of food wasted from a sample of students: extrapolate this wastage to calculate the average amount of food wasted for the entire school or college. How much would be wasted per month and per year?
 - b) Use the information you collect to inform the school administrators and management about the issue of food waste. Start a campaign to reduce food waste.

Visit:

[Almost half of the world's food thrown away, report finds](#)

[Love food. Hate waste.](#)

[The food waste network](#)

[Plan A: Love Food Hate Waste](#)