Factsheet for educators

AI-GENERATED TRANSLATION

This English version was translated from the German original “Factsheet für Multiplikator*innen” (FoodLabHome project, Leuphana University Lüneburg and Technische Universität Berlin, 2020) using an AI system (Claude, Anthropic) in November 2026. It has not been reviewed by the original authors. Where the two versions differ, the German original applies. Most of the sources linked below are in German.

1) Why food waste in private households matters

By the time food reaches our homes, it has already passed through several stages: cultivation, harvest, transport, possibly refrigeration, industrial processing and packaging. In the household, preparation is added as a further step. Every step along this value chain produces greenhouse gases that harm the climate, as water and soils are polluted and fossil resources are used to generate energy. If the food is then thrown away, further greenhouse gases are released, for example when the waste rots or is incinerated. The result is an unnecessary burden not only on our wallets but also on the environment.

Source: Umweltbundesamt (2018): Essensreste, Lebensmittelabfälle. Available at: https://www.umweltbundesamt.de/umwelttipps-fuer-den-alltag/essen-trinken/essensreste-lebensmittelabfaelle#unsere-tipps

2) Defining food waste

There are many different definitions of food waste. In the FoodLabHome project, we understand it as all parts of food that are thrown away, composted, fed to animals or otherwise disposed of in households without being eaten by people. We distinguish between avoidable and unavoidable food waste. Bones and many stones, pips and peels, for example, are not edible for humans and are therefore unavoidable. Which food (or leftovers) are treated as waste can, however, vary from household to household or from person to person (for example cucumber peel or similar).

3) How much food is wasted? An overview of the studies

A large number of studies have looked at the amount of food waste generated in households. However, they arrive at figures that sometimes differ considerably. There are several reasons for this. First, there is no "typical" household whose waste could be used to draw conclusions about all other households in Germany. Second, food waste is defined in different ways: does it include only avoidable waste, or also unavoidable waste such as inedible peels and stones? In addition, waste is difficult to record, not least because food is disposed of in different ways: not only in the organic waste bin, but also in the residual waste, on the compost heap, as animal feed or down the drain.

The following table gives an overview of current studies, the methods they used and their results.

How did the researchers measure food waste?	Results
This study by Swiss researchers (Beretta, Stucki and Hellweg) from 2017 is based on data on food waste in the United Kingdom, which were converted to Switzerland.	**116 kg of avoidable household food waste per person per year**
In 2011, the company Cofresco commissioned a study on food waste in Germany. More than 500 households were surveyed, and 200 households kept a detailed diary of their waste for one week.	**80 kg of household food waste per person per year**
In 2016–17, the market research institute Gesellschaft für Konsumforschung (GfK) collected food waste data on behalf of the German Federal Ministry of Food and Agriculture (study). For this purpose, 6,000 households in Germany each kept a diary of their waste for two weeks.	**24 kg of avoidable household food waste per person per year**
Another study was carried out in 2012 by a research group from the University of Stuttgart and the University of Natural Resources and Life Sciences, Vienna, on behalf of the German Federal Office for Agriculture and Food. It draws on waste statistics, waste sorting analyses and data from other EU countries.	**71–92 kg of household food waste per person per year**
In 2019, the Thünen Institute published a study on food waste. It uses data from the German National Nutrition Monitoring, in which 2,000 people were surveyed.	**37.3 kg of avoidable household food waste per person per year**

4) The greenhouse effect

A distinction is made between the natural and the human-made greenhouse effect. The natural greenhouse effect is what makes life on Earth as we know it possible in the first place. Without it, the average temperature would be around −18 °C. The human-made greenhouse effect, on the other hand, is critical. It is caused by greenhouse gases (GHG) such as CO_2, methane and nitrous oxide. CO_2 is produced mainly by burning fossil fuels such as coal, natural gas or oil and accounts for the largest share of human-made GHG. Methane is produced, for example, in agriculture through livestock farming, and nitrous oxide is also produced in agriculture when nitrogen fertilisers are used. These GHG intensify the natural greenhouse effect, causing the Earth's surface to heat up more and more. This is the cause of climate change, which has devastating consequences for people and the environment. Consequences of climate change include heat waves, drought and heavy rainfall.

In this four-minute video (in German), the German Environment Agency gives a good overview of how greenhouse gases and the greenhouse effect are connected: https://www.umweltbundesamt.de/themen/uba-erklaerfilm-treibhausgase-treibhauseffekt

Sources:
Stiftung myclimate (2020): Was ist der Treibhauseffekt? Available at: https://www.myclimate.org/de/informieren/faq/faq-detail/was-ist-der-treibhauseffekt-1/
Glossary of the Umweltbundesamt (2020), available at: https://www.umweltbundesamt.de/service/glossar/
Umweltbundesamt (2020): Folgen des Klimawandels. Available at: https://www.umweltbundesamt.de/themen/klima-energie/klimafolgen-anpassung/folgen-des-klimawandels-0#klimafolgen-welche-bereiche-sind-betroffen

5) Greenhouse gases

Greenhouse gases (GHG) are gaseous components of the atmosphere, such as carbon dioxide (CO_2), nitrous oxide (N_2O) or methane (CH_4). They cause the so-called greenhouse effect, which warms the Earth's surface and thus our climate. Greenhouse gases differ greatly in their impact on the climate. Methane, for example, is 25 times more harmful to the climate than CO_2, and nitrous oxide as much as 298 times. These so-called anthropogenic, i.e. human-made, greenhouse gases are produced along the entire food chain, from agriculture and industry to households.

Sources: Glossary of the Umweltbundesamt (UBA): https://www.umweltbundesamt.de/service/glossar/ [17.07.2020]; UBA explainer video on greenhouse gases and the greenhouse effect: https://www.umweltbundesamt.de/themen/uba-erklaerfilm-treibhausgase-treibhauseffekt

6) Where do the data for the Food Waste Tracker come from?

In the 2017 study by the Swiss researchers, the environmental impacts of food losses are calculated using a combined mass and energy flow analysis and life cycle assessment. The study contains detailed information on the quantities, causes and environmental impacts of wasted food. Environmental impacts are considered along the entire value chain, which comprises agricultural production, trade, processing, retail, food service, private households and the disposal of food waste. This study serves as the data basis for the Food Waste Tracker.

Juices appear in only a few studies on food waste and, because they are more difficult to measure, are also excluded from our calculator. This means that 27 of the 33 food categories in Beretta et al. (2017) can be calculated (divided into plant products, dairy and egg products, meat and fish products, other products, and inseparable items).

An overview of the climate impact of different food categories can be found in the online module: sustainability-education.net/foodlabhome-online-module/

7) CO_2 equivalents (CO_2eq)

CO_2eq stands for CO_2 equivalent. The various greenhouse gases differ in how strongly they affect the climate. The unit CO_2eq makes them easier to compare. It indicates the global warming potential, i.e. the contribution of a given greenhouse gas to global warming. An example: methane is 25 times more harmful to the climate than CO_2. This means that within the first 100 years after its release, 1 kg of methane contributes 25 times as much to the greenhouse effect as 1 kg of CO_2. The unit CO_2eq takes this into account. The global warming potential of CO_2 serves as the reference and is therefore given the value 1.