

FOOD REDUCED FOOD WASTE



One of the great miracles of life on this planet is the creation of food. The alchemy human beings do with seed, sun, soil, and water produces figs and fava beans, pearl onions and okra. It can include raising animals for their flesh or yield and transforming raw ingredients into chutney or cake or capellini. For more than a third of the world's labor force, the production of food is the source of their livelihoods, and all people are sustained by consuming it.

Yet a third of the food raised or prepared does not make it from farm or factory to fork. That number is startling, especially when paired with this one: Hunger is a condition of life for nearly 800 million people worldwide. And this one: The food we waste contributes 4.4 gigatons of carbon dioxide equivalent into the atmosphere each year—roughly 8 percent of total anthropogenic greenhouse gas emissions. Ranked with countries, food waste would be the third-largest emitter of greenhouse gases globally, just behind the United States and China. A fundamental equation is off-kilter: People who need food are not getting it, and food that is not getting consumed is heating up the planet.

Losing food to one waste heap or another is an issue in both high- and low-income countries, though the drivers differ. In places where income is low and infrastructure is weak, food loss is typically unintended and structural in nature—bad roads, lack of refrigeration or storage facilities, poor equipment or packaging, a challenging combination of heat and humidity. Wastage occurs earlier in the supply chain, rotting on farms or spoiling during storage or distribution.

In regions of higher income, unintentional losses tend to be minimal; willful food waste dominates farther along the supply chain. Retailers reject food based on bumps, bruises, coloring—aesthetic objections of all sorts. Other times, they simply order or serve too much, lest they risk shortages or unhappy customers. Similarly, consumers spurn imperfect spuds in the produce section, overestimate how many meals they will cook in a week, toss out milk that has not gone bad, or forget about leftover lasagna in the back of the fridge. In too many places, kitchen efficiency has become a lost art.

Basic laws of supply and demand also play a role. If a crop is unprofitable to harvest, it will be left in the field. And if a product is too expensive for consumers to purchase, it will idle in the storeroom. As ever, economics matter. Regardless of the reason, the outcome is much the same. Producing uneaten food squanders a whole host of resources—seeds, water, energy, land, fertilizer, hours of labor, financial capital—and generates greenhouse gases at every stage—including methane when organic matter lands in the global rubbish bin.

There are numerous and varied, but often invisible, dumps of food all around us. The interventions that can address key waste points in the food chain are also numerous and varied. The United Nations' Sustainable Development Goals speak to this chain of "orphaned" food, calling for halving per capita global food waste at the retail and consumer levels by 2030, as well as reducing food losses along production and supply chains, including those that occur postharvest. The root of the problem has many offshoots.

70.53 GIGATONS
REDUCED CO₂GLOBAL COST AND SAVINGS DATA
TOO VARIABLE TO BE DETERMINED

In lower-income countries, improving infrastructure for storage, processing, and transportation is essential. That can be as simple as better storage bags, silos, or crates. Strengthening communication and coordination between producers and buyers is also paramount for keeping food from falling through the cracks. Given the world's many smallholder farmers, producer organizations can help with planning, logistics, and closing capacity gaps.

In higher-income regions, major interventions are needed at the retail and consumer levels. Most important is to preempt food waste before it happens, for greatest reduction of upstream emissions, followed by reallocation of unwanted food for human consumption or another reuse. Standardizing date labeling on food packages is an essential step. Currently, "sell by," "best before," and the like are largely unregulated designations, indicating when food should taste best. Though not focused on safety, these markers confuse consumers about expiration. Consumer education is another powerful tool, including campaigns celebrating "ugly" produce and efforts such as Feeding the 5000—large public feasts made entirely from nearly wasted food.

National goals and policies can encourage widespread change. In 2015, the United States set a food-waste target, aligned with the Sustainable Development Goals. The same year, France passed a law forbidding supermarkets from trashing unsold food and requiring that they pass it on to charities or animal feed or composting companies instead. Italy followed suit. Entrepreneurs are capitalizing on wasted food—from turning homely fruits and veggies into juice to growing mushrooms from used coffee grounds to morphing brewery waste into animal feed. Of course, from an emissions perspective, the most effective efforts are those that avert waste, rather than finding better uses for it after the fact.

Given the complexity of the supply chain that food travels, waste reduction depends on the engagement of diverse actors: food businesses, environmental groups, antihunger organizations, and policy makers. Also critical are the world's 7.4 billion

eaters—especially those who live where food waste is greatest: the United States and Canada, Australia and New Zealand, industrialized Asia, and Europe. Whether on the farm, near the fork, or somewhere in between, efforts to reduce food waste can address emissions and ease pressure on resources of all kinds, while enabling society more effectively to supply future food demand. ●

IMPACT: After taking into account the adoption of plant-rich diets, if 50 percent of food waste is reduced by 2050, avoided emissions could be equal to 26.2 gigatons of carbon dioxide. Reducing waste also avoids the deforestation for additional farmland, preventing 44.4 gigatons of additional emissions. We used forecasts of regional waste estimates from farm to household. This data shows that up to 35 percent food in high-income economies is thrown out by consumers; in low-income economies, however, relatively little is wasted at the household level.

Left: This is the back end of a processing plant for vegetables in Burscough, Lancashire, UK. If you wonder why you have never seen a crooked carrot in your local market, commercial or natural, this is why. Vegetables are ruthlessly sorted to conform to "quality standards" set by the food chain, and this is the result. Some is carted off to piggeries, some as you can see is already rotting in the water.

Right: Feeding the 5000 is a program developed by founder Tristram Stuart to illustrate the scope of food waste. It is a public event wherein five thousand people are provided a free lunch from ingredients that would otherwise have been thrown away. The event has been held in London, Paris, Dublin, Sydney, Amsterdam, Washington, D.C., and Brussels.

