The State of Wasted Food

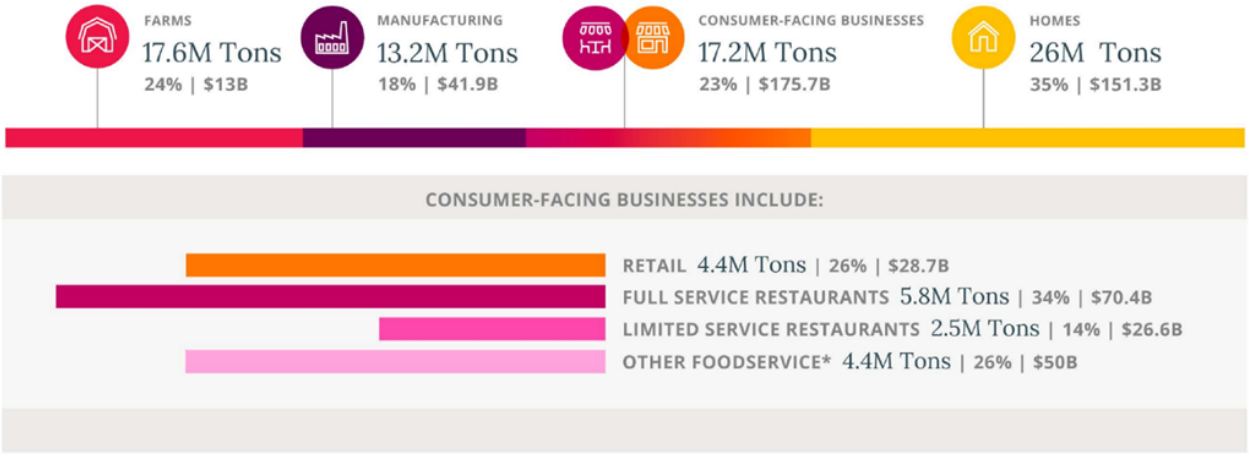
Food Rescue & Composting Program

Understanding Wasted Food

Wasted food occurs both within the supply chain and at kitchen tables. While projections can vary, the Environmental Protection Agency (EPA) estimates that up to 40% of all food in the U.S. is wasted. At the same time, in 2023, 13.5% of American households[1] were uncertain of having or unable to acquire enough food to meet the needs of all their members because they had insufficient money or other resources for food.

ReFED, Inc., a national nonprofit dedicated to ending food loss and waste across the food system by advancing data-driven solutions, has a formal agreement with the federal government to conduct research on food waste and potential solutions to support the national goal to reduce food loss and waste by 50% by 2050. The agreement charges EPA, the U.S. Food and Drug Administration (FDA), and USDA to work with ReFED "to increase collaboration and coordination in areas of mutual interest relating to the reduction of food loss and waste."[2]

ReFED estimates that 62.9 million tons of food were wasted in the U.S. in 2023, the equivalent of 120 billion meals and 16.2 trillion gallons of water, accounting for 2.71 million metric tons of methane emissions.[3] Food waste is generated at every stage of the supply chain for a wide variety of reasons. On farms, unpredictable demand and restrictive standards pertaining to the size and appearance of produce can leave good food left behind in the field. In manufacturing, processing inefficiencies and equipment malfunctions can result in an unsellable product. In retail and food service, poor inventory management and confusion over date labels can mean that wholesome food ends up in the trash. At home, time constraints and a lack of food management knowledge make it easy for produce to spoil before being used. For families, food waste might be the half-eaten sandwich that was left in the bottom of a lunch box. For a college student, wasted food might be uneaten food sent back in the dining hall dish return.



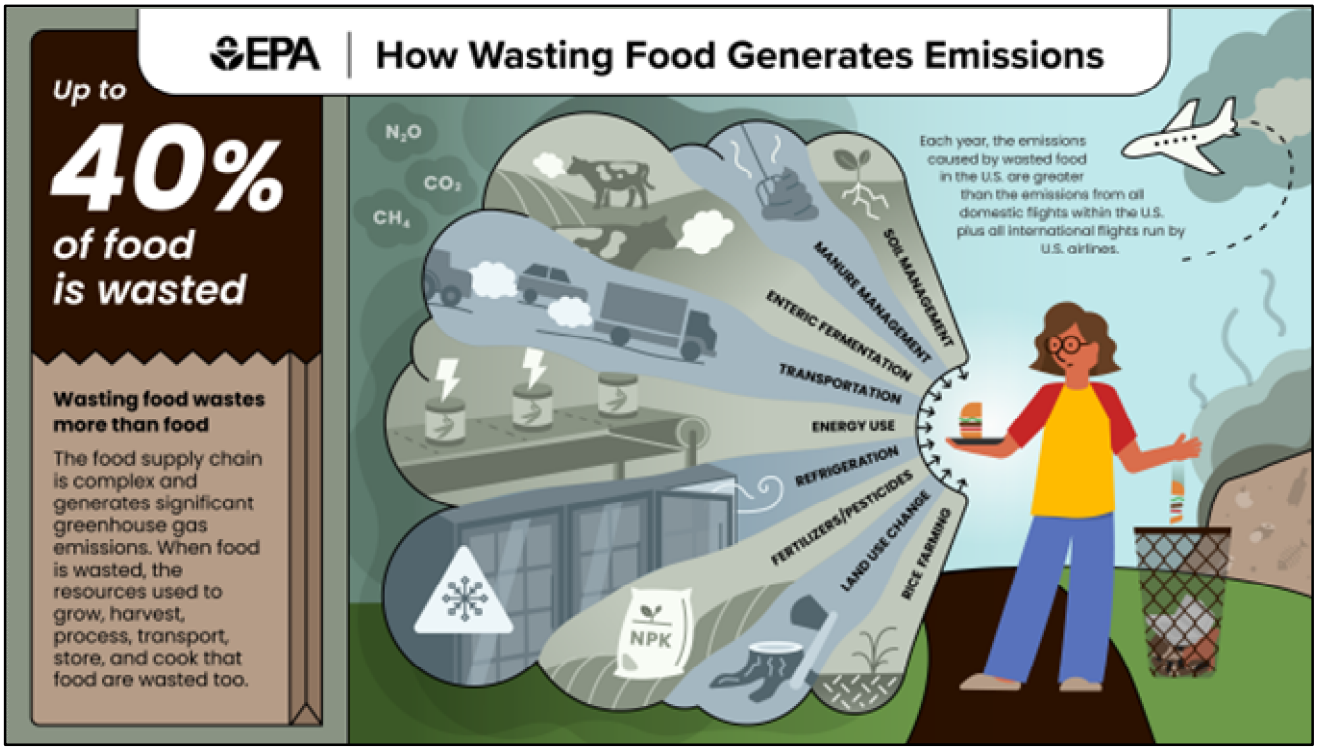
Distribution of Food Waste by Sector (ReFED)

[1] https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics
[2] https://www.epa.gov/sites/default/files/2019-04/documents/refed-epa-usda-fda_formal_agreement.pdf
[3] https://insights-engine.refed.org/food-waste-monitor?break_by=food_type&indicator=total-100-year-mtch4-footprint&view=detail&year=2023

While wasted food occurs throughout the supply chain, research shows that it is most prevalent at the consumer level, with 35% of all food waste occurring in homes.

As noted in EPA's report, *Estimating the Cost of Food Waste to American Consumers*, food waste costs the average American about $728 per year, or $14 per week.[4] For a family of four, that equates to spending $2,913 a year on food that they do not eat. Previously, the commonly cited statistic on the cost of food waste used cost estimates from 2010. Because prices in many food categories have more than doubled since 2010, EPA updated this statistic in their recent report to provide a more accurate estimate of the current cost of food waste.

Wasting food has economic, social, and environmental costs for all Americans. In addition to methane emissions from landfills, wasting food also wastes the resources that went into the production and transportation of that food. The agriculture sector relies on energy, water, fertilizers, and other resources in order to support the American food system. Because of this, it is important to consider that uneaten food has both upstream and downstream environmental consequences.



How Wasting Food Generate Emissions

[4] https://www.epa.gov/system/files/documents/2025-04/costoffoodwastereport_508.pdf

Greenhouse Gas Emission Impact of Food[5]

It is important to recognize that different types of food have different environmental impacts. EPA's Waste Reduction Model (WARM) is a tool that estimates the potential greenhouse gas (GHG) emissions, energy savings, and economic impacts of different management pathways for a variety of different materials that are commonly found in MSW landfills; the emissions estimates for various food categories are outlined in Table 1.

Table 1: Quantified Emissions from Food Waste

Category	GHG Emissions per Ton of Material Produced (MTCO2E)
Food Waste	3.66
Food Waste (non-meat)	0.76
Food Waste (meat)	15.10
Beef	30.09
Poultry	2.45
Dairy Products	1.75
Bread	0.66
Grains	0.62
Fruits and Vegetables	0.44

[5] https://www.epa.gov/waste-reduction-model/versions-waste-reduction-model

EPA's Wasted Food Scale

EPA developed the Wasted Food Scale to help individuals, organizations, and governments determine the best uses for food, emphasizing strategies with the greatest benefit to the environment. The Wasted Food Scale emphasizes actions that prevent and divert food waste from disposal. It was informed by an environmental impact assessment of different food waste management pathways as discussed in EPA's report From Field to Bin: The Environmental Impacts of U.S. Food Waste Management Pathways.[6] The scale prioritizes pathways that use food to nourish people and promotes circularity in the economy and food system. DEQ uses the guidance provided in this scale to develop and prioritize programs that aim to stop food waste.

EPA's Wasted Food Scale

[6] https://www.epa.gov/system/files/documents/2023-10/part2_wf-pathways_report_formatted_no-appendices_508-compliant.pdf

The Connection Between Wasted Food & Methane

Methane (CH_4) is a GHG that affects the earth's temperature and climate system. Accounting for about 16% of global GHG emissions, methane is 28 times more potent than carbon dioxide, making it more efficient at trapping heat in the atmosphere when compared to the warming effect of other common GHGs. In 2024, USDA estimated that methane is responsible for approximately 30% of the increase in global temperature since the Industrial Revolution. Atmospheric methane concentrations have more than doubled in the last two centuries, largely due to human-related activities.[7]

According to EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks, municipal solid waste (MSW) landfills are the nation's third largest source of methane emissions.[8] Food waste is the single largest substance by volume sent to MSW landfills in the U.S. and also in Virginia.[9] Without the presence of oxygen, food in landfills cannot follow the natural decomposition process and instead releases methane gas. While decay times are dependent on local conditions specific to each landfill, on average, it takes 3.6 years for half of the carbon in landfilled food to degrade into methane. In 2020, food waste was responsible for approximately 58% of the fugitive methane emissions from MSW landfills (note: references to "landfills" in this document refer to MSW landfills).[10] Some of the key findings[11] of EPA's report, Quantifying Methane Emissions from Landfilled Food Waste are:

- Food waste breaks down faster than other landfilled materials. An estimated 61% of methane generated by landfilled food waste is not captured by landfill gas collection systems.
- Improvements in landfill gas collection systems have led to a decrease in total landfill methane emissions. Despite this, emissions from landfilled food are increasing.
- An estimated 34 metric tons of methane emissions are released per 1,000 tons of landfilled food.

[7] https://www.epa.gov/system/files/documents/2024-06/epa_usda_methane_and_food_waste_fact_sheet.pdf
[8] https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-main-text.pdf
[9] https://www.deq.virginia.gov/our-programs/pollution-prevention/executive-order-17
[10] https://www.epa.gov/system/files/documents/2023-10/food-waste-landfill-methane-10-8-23-final_508-compliant.pdf
[11] https://www.epa.gov/system/files/documents/2023-10/food-waste-landfill-methane-10-8-23-final_508-compliant.pdf