Food Waste in the United States

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Food Waste in the United States

Summary+

Americans produce billions of pounds of food waste every year, affecting the environment and economy in which they live. The average American throws out more than 400 lbs. (181 kg.) of food annually, which translates to 30%-40% of the total US food supply. Issues including unsustainable practices within the food supply chain, high aesthetic standards for produce among retailers and customers, and uninformed consumer behavior all exacerbate the food waste problem. Among other reasons, the negative consequences of food waste include increased greenhouse gas emissions, wasted and compromised water supplies, and economic losses. Redistributing unwanted or unsold food to organizations like food banks and churches not only reduces food waste but curbs food insecurity in the US. Household composting also diverts food from landfills, thereby mitigating greenhouse gas emissions.
Key Takeaways+

- Americans waste 108 billions lbs. (49 billion kg.) of food per year, and trends are on the rise.\(^{192}\)
- Among other factors, the high levels of food waste are attributed to unsustainable food production and transportation, high aesthetic standards for fruits and vegetables, and various consumer behaviors.
- As a result of this food waste problem, large quantities of carbon dioxide and methane gas are emitted into the atmosphere, water supplies are wasted and contaminated, and economic opportunities are lost.
- Redistribution of surplus foods and household composting reduce the amount of food waste that Americans produce each year.

Key Terms+

Composting—Composting is the natural process of recycling organic matter, such as leaves and food scraps, into a fertilizer that can enrich soil and plants.\(^3\)

Culling—Culling is the removal of products based on quality or appearance criteria, including specifications for size, color, weight, and blemishes.\(^4\)

Food Insecurity—Lacking the means to get sufficient food for each person in a household to live a healthy lifestyle.\(^5\)

Food Miles—Food miles are the distance food is transported from the time it is produced or harvested until it reaches the consumer.\(^8\)

Food Supply Chain—A food supply chain refers to the processes that describe how food goes from the farm to the table. These processes include production, processing, distribution, consumption, and disposal.\(^7\)

Every step of the supply chain requires human or natural resources.\(^8\)

Food Waste—Edible food that is available for human consumption but is not consumed.\(^9\)

Hunger—A sensation of discomfort due to the lack of food.\(^10\)

Leachate—Leachate is a contaminated liquid that is generated as water percolates through a solid waste disposal site.\(^11\)
Q: What is food waste?

A: Food waste refers to any food disposed of during the production, processing, and distribution phases of the food supply chain. For example, during sorting operations in the supply chain, food that is fit for consumption may be rejected due to aesthetic deformities such as irregular size, discoloration, weight inconsistencies, and blemishes. Food waste may also refer to any food that has fully completed the supply chain up to a final product but gets scrapped by retailers, restaurants, and consumers for a variety of reasons.

Q: How is food waste measured?

A: The process of measuring food waste in the US is fairly inconsistent due to a lack of awareness, regulation, and defined measurement methods. For instance, current estimates of the quantity of food waste in the United States range from 35 million tons (from the Environmental Protection Agency in 2018) to 103 million tons per year (from the Food and Agriculture Organization in 2011). To clarify these discrepancies, the Food and Agriculture Organization is currently developing two new indices—the Food Loss Index (FLI) and the Food Waste Index (FWI). The FLI focuses on measuring food losses that occur from production plants up to (but not including) grocery stores, convenience stores, food service facilities, and other food retailers. The FWI, on the other hand, focuses on the waste that occurs at these retailers as well as restaurants, households, and other consumer-level sites. These two indices together will provide a more accurate and holistic look at national food waste.

Four measurement methods provide insight into food waste in households: distributing self-reported questionnaires in a survey; using food waste diaries; collecting waste with kitchen caddies; and coding food waste from photographs. All of these methods have their advantages and disadvantages, however, the survey method is particularly useful due to its low monetary cost for researchers and low effort for participating households. The Household Food Waste Questionnaire, for example, is a survey developed to gather feedback that is not based on individuals’ memory or awareness of their food waste habits. This questionnaire focuses on set time periods and specifies detailed product categories, whereas previous surveys asked general questions with no reference to time periods or product categories. Though household food waste measurements can be ambiguous, efforts are being taken to increase precision and reliability.
Restaurants often inconsistently measure food waste—or do not measure it at all. A survey of 29 restaurants in Berkeley, California was conducted to track food waste response and measurement. Although this sample may not be representative of all restaurants across the US, it indicates the inconsistencies in measuring food waste. For instance, the survey shows that 34% of these restaurants did not measure the amount of food waste they produced. 21% 24% of the restaurants used food waste accounting tools to identify rough patterns and estimate the amount of food wasted regularly. 22 Only about 7% of restaurants used a weight accounting system—which keeps track of the exact weight, types of food wasted, and the reason for disposal. 23 Weight accounting systems produced highly accurate measures that have been shown to be effective in reducing food waste. 24 Therefore, the study found that only a small minority of the restaurants sampled used accurate methods to measure their food waste. 25

Due to underreporting and inaccurate methods of measurement, most food waste measurements used in the following sections underestimate the actual sum of food waste in the US. Nevertheless, these measurements provide scope for how ubiquitous the food waste problem is in the US.

Q: How prevalent is food waste in America?

A: Wasted food ranks as the number one material in US landfills, accounting for 24.1% of all municipal solid waste. 26 Americans waste 46% of fruits and vegetables, 35% of seafood, 21% of meat, and 17% of dairy products. 27 Altogether, Americans waste between 30% and 40% of the total US food supply. 28 29 Considering that 78% of surveyed Americans believe they waste less than the average person, 30 the food waste problem could be perpetuated by a general lack of awareness.

Q: In the United States, where does most food waste take place and who is most likely to waste it?
Food waste exists across households, restaurants, and supermarkets. Forty-three percent of food waste in America comes from households, where produce wilts, milk spoil, and leftovers are placed in the back of the fridge until they are thrown out. Approximately 18% of food waste occurs in restaurants. Buffet-style restaurants are particularly wasteful because they produce an overabundance of food to satisfy the consumers’ all-you-can-eat mentality, and the consumers often overestimate their ability to consume food. Another 16% of food waste occurs at farms due to cosmetic imperfections, lack of labor, and market prices. Meanwhile, supermarkets are responsible for producing 13% of food waste, which translates to about 43 billion lbs. (20 billion kg.) of food waste annually. Overstocking shelves, throwing out misshapen produce, and sending unsold products to the landfills rather than the food banks all contribute to this sum. Manufacturers and institutions such as schools, hospitals, or prisons make up the remaining 10% of food waste (2% and 8%, respectively).

Food waste production is also distributed across household income levels. Researchers have identified that higher-income households waste more food than lower-income families. According to multiple sources, after consumer wealth reaches a spending threshold of $6.70, or about $10 per capita per day, food waste increases rapidly. For instance, one study calculated that food levels increase by approximately 5-6 calories per 1% increase in affluence. Since healthier diets tend to be more expensive and include more produce and other perishable items, some of this waste can be attributed to food spoiling before the household had the chance to eat it. Certain households waste less food, such as those with larger families or those receiving federal food assistance benefits. But even the most frugal households still waste 8.7% of the food purchased.

Regarding food waste trends across the US, the western region records higher proportions of food waste than in eastern and central regions. For instance, the rate of food waste per capita in the western region is 1.44 times higher than the eastern region. It is unclear why the western US has higher food waste proportions, but researchers are currently examining the differences between the west and the other regions.

Q: Who is most affected by food waste in the US?
In the US, increased food waste corresponds with increased food insecurity, which is defined as the disruption of eating patterns because of lack of money and other resources.\(^{50}\) In a country with enough resources to feed every member of the population, more than 38 million people were considered food insecure in 2020 because, among other reasons, the US wastes food rather than redistributes it to underserved communities.\(^{51,52}\) The US officially measures food insecurity in the US using a survey, which consists of 18 questions about food hardships due to financial constraints.\(^{53}\) A household is said to be "low food secure" if they respond affirmatively to 3 to 7 questions and "very low food secure" if they respond affirmatively to 8 or more questions.\(^{54}\) By reducing the rates of wasted foods, millions of the Americans currently suffering from food insecurity would have access to food.\(^{55}\)

**Q: When did food waste become a problem in the United States?**

A: During the late 18th century and early 20th century, the rise of industrialization and manufactured products changed how Americans consumed and therefore disposed of food.\(^{56}\) With factories producing mass quantities of food more rapidly, food became more accessible and less expensive. As a result, consumers were quicker to dispose of food because it cost them less money and effort to secure. Due to the food production processes and behaviors that have developed as a result of industrialization, the US per capita food waste has increased by 50% since 1974.\(^{57}\)

The amount of food waste in the US has also increased since the outset of COVID-19. During March 2020, grocery spending spiked by 70% compared to pre-COVID levels and sustained a 10% increase in the following three months.\(^{58}\) Though some grocery spending and purchasing habits have normalized over the last two years, total food expenditures in the US increased by $49 billion from February to December 2021 due to economic recovery and restaurants reopening.\(^{59}\) Increased purchasing ultimately leads to increased food waste.

**Q: How does the US compare to other countries?**
Concerning efforts to prevent food waste and loss, the US is ranked number 22 among 35 high-income countries—number 1 referring to a country at the forefront of food sustainability initiatives and number 35 referring to a country with the poorest practices. Food waste per capita is higher in America than in many other regions. For instance, average American consumers waste 10 times the amount of food as individuals in Southeast Asia or sub-Saharan Africa. Due to its poor performance compared to other high-income countries, the US will be the focus of this brief.

Contributing Factors

Unsustainable Food Production

Production Errors

Food production errors contribute to the high rates of food waste in the United States because these errors damage food and thus increase the likelihood of food failing inspections and discarded food. Some production errors include equipment defects, human errors while handling food or equipment, labor shortages, improper cleaning and sanitation, power shortages and blackouts, and hazardous product damages. During production processes, 20% of produce is wasted because fruits and vegetables have soft tissue that is highly susceptible to mechanical damages. In 2011, labor shortages in harvesting and food packing also led to over $140 million of crop losses for the state of Georgia. Although some production errors are inevitable, most could be eliminated by adopting more vigilant practices such as increased system monitoring and improved storage conditions.

Overproduction
Food overproduction contributes to food waste in the US because the excess supply of food is often discarded. A surplus production of 30% is typically necessary to compensate for losses during production and distribution in the food production industry. Still, many suppliers produce a surplus of over 50%—20% more than what is necessary. Specifically, farmers tend to overplant to circumvent the effects of bad weather, pests, and other factors that reduce yields and make it difficult to fulfill their contracts with supermarkets. Since supermarkets refuse to purchase produce that is irregularly shaped, farmers are incentivized to overplant even more. Surplus food that is not sold to retailers or consumers before it becomes inedible might be donated or redistributed, but logistical limitations and hygiene regulations can prevent successful redistribution. Therefore, a portion of this additional 20% is often unpurchased, unused, and wasted.

Unsustainable Food Transportation

Poor Packaging

Transportation to retailers in disposable packaging often damages food, which typically becomes food waste. Single-use containers made of plastic or paper materials such as polypropylene and cardboard are common disposable packages in the US. The use of these containers contributes to food waste because these packages do not consistently protect food from the heat, cold, moisture, drying, hazardous substances, and contamination that affect food during transportation and distribution. For instance, more than 8.5% of fruits and vegetables transported to distribution centers and retailers in disposable packaging is damaged. Poor packaging techniques causes 10% of grain products, 5% of seafood, and 4% of meat to be lost. Proper packaging, on the other hand, protects food from harmful influences, slows deterioration, extends shelf life, and increases the safety of food. Poor packaging methods do not prevent dehydration, juice loss, and bacterial growth, greatly reducing the shelf-life of food and leading to more food wasted in production and transportation.

Retailers are regarded as barriers when it comes to improving food packaging. Retailers prefer to move incrementally rather than in large evolutionary leaps because they are mainly interested in technologies that provide clearly identifiable benefits to consumers. For instance, retailers often select packaging materials that customers are familiar with, like cardboard, over innovative packaging solutions, like packages with moisture control agents. Unfortunately, these retailer preferences prevent large-scale improvements to food packaging, leading to further food waste in the US.
Distance to Travel

The distance food travels from production plants to restaurants and grocery stores is extensive because the majority of food consumed today passes through a complex network of a few large producers, processors, transporters, and distributors before reaching consumers. With an increasingly globalized food marketplace, over 200 countries or territories and 125,000 food facilities across the globe supply about 32% of the fresh vegetables, 55% of the fresh fruit, and 94% of the seafood that Americans consume each year. Studies estimate that processed food in the United States now travels over 1,300 miles on average, and fresh produce travels over 1,500 miles before reaching grocery stores and restaurants. Lengthy transport times and distances lead to more damage during transportation and reduced shelf life. At this time, no quantitative evidence is available to further discuss the effects of travel distances on food waste, and additional research would be valuable. With the food marketplace becoming more complex and globalized, travel distances will likely continue to contribute to the food waste problem in the US.

Temperature Control

Ineffective temperature control during transportation also contributes to food waste because improper temperatures lead to damage and contamination. As routes from production plants to final destinations become more complex and globalized, temperature control technologies for animal, plant, and frozen foods need to be more accurate to account for these changes. Even though field heat—the difference in temperature between the crop harvested and the optimal storage temperature of that product—naturally disperses after harvesting, optimal storage temperatures must be maintained during the entire transportation process. For instance, certain fruits and vegetables (for example, blackberries, strawberries, peaches, broccoli, lettuce, and peas) must be kept at 32–36°F throughout the transportation process. Due to an inability to maintain these recommended temperatures between harvest and
consumption, as much as 50% of temperature-sensitive produce is lost post-harvest.85 Distributors struggle to maintain temperatures primarily because of inadequate access to cold-chain logistics that connect harvested produce with consumers.86 Cold-chain logistics are temperature-controlled processing factories, vehicles, and retail establishments that ensure perishable foods are kept at the optimum temperature throughout the food supply chain.87 Insufficient temperature controls damages produce, which becomes more susceptible to cross-contamination from plants and human pathogens.88 This causes distributors and retailers to cull more food before sales, which adds to food waste.

High Aesthetic Standards

Food waste is heightened by Americans’ aesthetic standards for fruits and vegetables because they often refuse to purchase imperfect foods.89 For years, retailers have competed with each other to achieve optimum product appearance in order to satisfy customers. They demand large, vibrant fruits and vegetables from farmers to secure sales and boost revenue. Because retailers have set the bar high for product appearance, consumers maintain their high expectations. For instance, a study of 964 participants tested the impact of food shape abnormality on buying intentions and revealed that a higher portion of participants were willing to purchase normal looking food products over abnormal looking food products.90

Therefore, most grocery stores have stopped accepting misshapen fruits and vegetables from farms and other suppliers altogether.91 For instance, one cucumber farmer estimated that less than 50% of the cucumbers he grows successfully leave his farm and, of the cucumbers that do leave, about 75% are culled before being sold at a retailer.92 One tomato packing company also reported that it fills a dump truck with 22,000 lbs. (9,979 kg.) of culled tomatoes every 40 minutes during mid-season.93 A recent study found that up to 20% of produce is too cosmetically compromised to meet commercial standards.94 This type of vetting system leaves both suppliers and distributors with thousands of
Consumer Behavior

Over-purchasing

Poor consumer behavior, such as over-purchasing, contributes to food waste because consumers typically discard excess food before it can be used. American consumers may over-purchase food because they fail to plan meals, do not use shopping lists, inaccurately estimate amounts needed to prepare meals, or prefer to purchase their foods in bulk quantities. In a survey of 2,000 Americans, 46% claimed they purchase food at bulk retailers. For example, consumers often purchase large containers of tree nuts like almonds and cashews at bulk retailers for a reduced price. However, due to their high fat content, these nuts go rancid sooner than expected and typically expire between 1-2 months. Though no research has been conducted to identify the amount of bulk food discarded in the US, the common practice of purchasing food sold in bulk may contribute to the high levels of food waste in the US.

The collective response to the COVID-19 outbreak has also inflated rates of household food waste because of concerns about food security during a pandemic. After the spring of 2020, 37% of consumers reported buying more groceries each time they went shopping. Larger shopping trips exacerbate waste, as this behavior requires effective meal planning and storage practices. Online grocery shopping also increased, with 16% of consumers using online shopping since the rise of grocery delivery after COVID-19. Studies show that online shopping encourages buyers to purchase food items that seem desirable but are not needed and ultimately wasted. It increases a consumer's "psychological distance" to food—their cognitive separation between themselves and food—which is linked to food waste. When a consumer does not physically connect to food by placing it in an actual cart, it becomes easier for them to waste that food.

Confusion Over Date Labels
Misunderstanding date labels significantly contributes to food waste in the United States because consumers dispose of food that is still fit for consumption. Consumers do not know the meaning of the variety of labels—"best-before," "sell-by," "use by," and so forth. For instance, the "best-before" date expresses that a product will be of the best quality before the given date but can still be safely consumed for a while longer. Past the expiration date, most dairy products can last 1 to 2 weeks, eggs about 2 weeks, and grains over a year. Because most Americans are unaware of these nuances, 80% of consumers discard food that is still fresh. Research reveals that misunderstood food labels account for roughly 20% of all consumer waste in the US—a $29 billion value.

**Ineffective Cooking and Storage**

Ineffective cooking and storage practices among Americans contribute to food waste because excess prepared food is often tossed. Recipe serving sizes and plates have grown, which increases portion sizes, and large portions can lead to uneaten food. The surface area of the average dinner plate in America expanded by 36% between 1960 and 2007, meaning that individuals often serve more food to fill plates. In the Joy of Cooking cookbook, serving sizes have increased by 33.2% since 1996. Thus, recipes that once served 10 now serve 7 on average. In some cases, more food on plates leads to more food in the trash. Excess prepared food would not produce as much waste if Americans had more appropriate attitudes toward leftovers. While some Americans eat leftovers or repurpose them into another meal, many more do not. In a 2015 survey, 53% of respondents said that they threw away leftovers at least weekly. And in households with children, that figure jumped to 70%. Excess prepared food creates leftovers, and leftovers often become food waste. In addition, some of these leftovers are tossed due to the drying and spoilage that result from poor storage practices.

American consumers generally fail to use storing strategies to increase food longevity in their households. For instance, space constraints in the fridge combined with a lack of knowledge about where to best locate certain types of foods (veggies in high humidity drawers, fruits in low humidity drawers, meat and poultry on lower shelves, and so on) often hinder effective storage. In 2016, a survey was conducted to gain further insight on consumer knowledge and food waste generation in households. Out of the 500 individuals who completed the survey, 153 (30.6%) marked that they lacked knowledge about proper food storage and would appreciate advice on this topic to avoid food waste. Though typically unintentional, consumer knowledge and behavior contribute to the production of food waste in the US.
Increased Greenhouse Gas Emissions

Food waste causes increased greenhouse gas emissions because the production, transportation, and handling of wasted food generates carbon dioxide (CO2) emissions. In the United States, 19% of the total use of fossil fuels (like petroleum and coal) is used to fertilize, apply pesticides, harvest, and prepare food for consumption. When burned, these fossil fuels produce large quantities of CO2. The diesel and gasoline used to transport food from the farmer to the store, the store to the home, and the home to the landfill also contribute to the annual production of 432 million metric tons of CO2. From fertilizing food to transporting it to grocery stores, the production of lost or wasted food in the US generates 170 million metric tons of CO2 per year, which is the equivalent to annual emissions of 42 coal-fired power plants or 32.6 million cars.

Wasted food left to rot in landfills also increases greenhouse gas emissions. According to the Environmental Protection Agency, only 2.6 million tons of food scraps were composted in 2018, compared to 35 million tons that went into landfills. When food rots in landfills, it emits methane, a greenhouse gas that is 28–36 times more potent than CO2. As CO2 emissions decelerated during 2020, atmospheric methane levels increased. Methane is the main contributor to the production of ground-level ozone, a hazardous air pollutant and greenhouse gas, exposure to which causes about 60,200 deaths in the US per year. The impact of methane on climate change over 20 years is 86 times greater than CO2 and has accounted for roughly 30% of global warming since pre-industrial times. Overall, food waste contributes to methane production, which contributes to air pollution, death, and global warming.
Compromised Water Supply

Because water is an essential component in food production and processing, food waste also depletes the US water supply. It is estimated that 21% of freshwater that is used to grow food in America is ultimately wasted.\textsuperscript{132} For example, a single wasted apple equates to 72 gallons (273 liters) of wasted water.\textsuperscript{133} If the United States grew all of the country's wasted food (108 billion lbs. [49 kg.] of food according to Feeding America) in one location, growing the food on this farm would consume all of the water used in California, Texas, and Ohio combined.\textsuperscript{134, 135}

Food waste also affects the US water supply because the wasted food pollutes groundwater and streams as it decomposes. Food waste has a moisture content of 73%, which means that as food waste decomposes, the remaining moisture often produces leachate.\textsuperscript{136} Leachate is the liquid that leaches from landfills and contains high concentrations of dissolved organic matter, inorganic chemicals, and heavy metals—contaminants that lead to environmental issues.\textsuperscript{137, 138} In the United States, the Code of Federal Regulations requires that landfills install liners to protect groundwater and soil from leachate leakage.\textsuperscript{139} Landfills are also required to use leachate collection systems that remove leachate for treatment and disposal.\textsuperscript{140} Despite these regulations, the total volume of leachate generated in the US was estimated to be 61.1 million cubic meters (2,157.7 million cubic feet), with 78% of this volume coming from landfills in wet climates that contain 47% of the solid waste in the US.\textsuperscript{141} With moisture-rich foods making up 21% of the solid waste in US landfills, food waste exacerbates leachate production.\textsuperscript{142} As leachate continues to percolate through US soil and affect groundwater and streams, it leads to eutrophication—excessive richness of nutrients in a body of water—which causes dense plant growth and life-threatening effects on animal life.\textsuperscript{143}

Economic Losses

Food waste lends to economic losses because producing and purchasing food requires large sums of money. In the United States alone, about 40% of all food is wasted, which is equivalent to $408 billion each year.\textsuperscript{144} The average American throws out more than 1,250 calories per day, or more than 400 lbs. (181 kg.) of food annually.\textsuperscript{145} This costs a household of four an average of $1,800 annually—$700 more than the average monthly mortgage payment in the US and 10% of the average American's disposable income.\textsuperscript{146, 147}
Considering the labor, material resources, time, and energy that go into food production, a substantial amount of money is wasted growing, processing, transporting, and disposing of food that is never eaten or used. The Food and Agriculture Organization recently estimated annual global losses of $1 trillion from resource costs, the United States being one of the top contributors to these losses. The labor and resources required to simply dispose of food waste costs the US over $1 billion per year. Thus, food waste contributes to substantial economic losses in the US.

If the US continues to waste food at its current rate, it averts potentially $100 billion of societal economic value. Restaurants, for example, lose $1.6 billion each year by failing to track food waste, using large plates, mismanaging their inventory, and avoiding food waste mitigation strategies in general. Food retailers also lose profit by tossing imperfect produce, rejecting innovative food packaging solutions, and declining the construction of composting facilities. By dismissing food waste prevention and recycling strategies, the US loses thousands of job opportunities. For instance, 15,000 new jobs are lost to prospective compost processing efforts. Additional job opportunities are lost with minimal expansion of food donation transportation and handling services. As the US dismisses food waste mitigation strategies, it forgoes billions of dollars of economic opportunity as well as thousands of much-needed jobs.

**Best Practices**

**Food Redistribution**

The US has enough resources to feed every member of the population, yet more than 38 million people, including 12 million children, are considered food insecure. Each year, Americans waste 108 billion lbs. (49 billion kg.) of food, which equates to 130 billion meals. By reducing the rate of food waste by just 15%, nearly 20 billion meals could be salvaged and 25 million more Americans could eat consistently for a year. One solution for this problem is the donation and redistribution of unwanted or unsold food to low-income populations. In this process, food is redirected to
organizations like food banks, churches, shelters, orphanages, and safe places that offer aid to poor, disabled, or abused individuals. Regina Anderson, the Executive Director of the Food Recovery Network, said, “There’s no shortage of food. That has never been the case in America. We can throw most of our food away and still have enough to feed everybody. It’s just a distribution issue.”

There are many organizations across the United States who work to redirect surplus food to communities in need. For instance, Aloha Harvest, Hawaii’s largest food waste nonprofit, picks up excess food from donors and delivers it to food relief organizations across O‘ahu. Over the past 20 years, the group has distributed over 28 million lbs. (13 million kg.) of food. City Harvest, located in New York, deploys 26 refrigerated trucks to pick up food from nearly 2,500 farms, restaurants, grocery stores, and manufacturers, then delivers this food to hundreds of soup kitchens, food pantries, and community food programs. The organization gathers approximately 300,000 lbs. (136,078 kg.) of food each day and has delivered more than 950 million lbs. (431 million kg.) of food to food-insecure New Yorkers since 1982. Food Forward, a California-based nonprofit, recovered and distributed over 62 million lbs. (28 million kg.) of fruits and vegetables in 2020. This organization donates 100% of the food to more than 1,800 hunger relief groups throughout Southern California. Hundreds of similar organizations exist across the United States to reduce food waste and the number of food-insecure individuals.

In 2017, approximately 86% of these food redistribution organizations encountered significant challenges. Challenges include lack of sustainable financial support, volunteers and personnel, adequate facilities, and communication about surplus food that could be donated before expiration. Surplus food redistribution is a growing practice in the US with activities often backed by “Good Samaritan” legislation, which protects those who donate food in good faith in the case that someone becomes sick from consuming it. These legislations are often criticized for condoning potentially unethical behavior. Social services taking ownership of food waste and food insecurity, like food redistribution organizations, are also argued to reduce the positive pressure on governments to address structural poverty and food insecurity. Therefore, it is possible food redistribution organizations are bandaging the food waste problem rather than promoting sustainable solutions.

### Household Composting

Composting is the natural process of recycling organic matter, like leaves and food waste, into a fertilizer that can...
Individuals can compost food waste such as fruits and vegetables, eggshells, tea bags, nut shells, and coffee grounds. The four basic ingredients for compost are "greens" from grass clippings and food scraps, "browns" from dead leaves and twigs, water, and air. The green materials provide nitrogen, which is essential for plant and animal growth, and the brown materials supply carbon, which is a food source for decomposers. For every 1 part green material, there should be 2-4 parts brown material.

To facilitate the composting process, individuals should turn compost piles often and adjust the water content so the compost is about as moist as a wrung-out sponge. Using a bin is the simplest and cheapest method for at-home composting. A closed compost bin keeps composting materials together and helps retain heat and moisture. Individuals can purchase a compost bin online and at most home improvement stores for $30-$80, or they can easily build one themselves out of wine crates, plastic storage bins, garbage cans, or wood pallets. In general, indoor and outdoor composting methods are similar, though indoor compost bins are typically smaller. Once the bin is filled, individuals should refrain from adding new green and brown materials to allow the compost to fully decompose, which takes anywhere from 4 weeks-12 months depending on conditions. If the compost has a crumbly and smooth texture, a deep brown hue, and an earthy aroma, it is likely ready for use. Individuals can use the finished product as mulch, add it to potting soil, distribute it on lawns, or mix it into garden beds.

Household composting has environmental benefits. It diverts food waste from landfills and, resultantly, diverts methane gas from entering the atmosphere. In 1996, the city of San Francisco established a program to collect compostable materials from households. This program prevents 650 tons of food waste and yard trimmings from ending up in landfills per day and converts them into about 350 tons of finished compost per day. Since 2012, it has managed to divert over 80% of waste from landfills. These efforts reduce greenhouse gas emissions by 90,000 metric tons each year, which is equivalent to the annual greenhouse gas emissions from 20,000 passenger vehicles. Along with reducing food waste and greenhouse gas emissions, composting also reduces the amount of water needed to produce crops. Compost contains nitrogen, phosphorus, potassium, and other primary nutrients needed by garden crops. For every 1% increase in nutrients and organic matter in soil, an acre of soil can hold about 20,000 gallons (75,708 liters) more water. Therefore, by composting and using compost, farms and households can use less water and produce better crops.

Only 5% of food waste is composted in the US, and the remainder is sent to landfills and incinerators. These low rates imply that there are factors preventing US citizens from composting their food waste. In a survey of 792 Americans who do not compost, 38% of respondents reported that they do not compost because they do not have enough space in their home or yard, 20% of respondents reported that it
requires too much work, and another 20% reported that they do not like having a “trash area” in their home. Though some of these reservations could be mitigated by educating individuals about composting and its importance, others (like the lack of space in their home or yard) prove more difficult to address. One in eight Americans live in apartments, which provide limited indoor and outdoor space for composting. It is possible for individuals to compost in their apartments, but this may require purchasing an expensive composting solution like an electric composter. Though curbside composting programs like the one in San Francisco help address this and other concerns, many cities in the US do not offer these programs. This lack of infrastructure places responsibility on households and increases the amount of work required, deterring Americans away from composting.

United States

Jayden Davis

Jayden is studying public health and nonprofit management. Each day, she aims to increase her social awareness and compassion. Working with and alongside multiple nonprofits and interning in Uganda has increased her devotion to doing impact-driven, sustainable good in the world. She is particularly interested in addressing inequities in healthcare systems. After earning her undergraduate degree, she plans to pursue a Master of Business Administration to supplement her knowledge and open more doors to make an impact.

Disproportionate Exposure to Air Pollution for Low-Income Communities in the United States  Lack of Quality Civic Education in Public Schools in the United States