

American Food Waste and its Solutions

Ariana M. Sims, Dr. Tyner, Food Security & Sustainability, 10 Dec. 2023

Introduction

Food waste is a massive issue, not only in the United States but around the world. It is estimated that about 119 billion pounds of food is wasted each year in the United States alone (*Food Waste and Food Rescue*, Feeding America). Not only is food waste inefficient, but it also contributes to various environmental issues such as global warming. This project plans to investigate how much food is wasted, where it goes, and more effective processes of management.

Overview of the US food system

The current US food system consists of a couple of core components. Primary production of food originates with farmers, ranchers, and fisheries who combine the use of land, water, labor, capital, and machinery to produce raw agricultural commodities like livestock and crops (*A Frame for Assessing effects of the food system*, NIH). It is rare that food goes directly from farmers to consumers. It is typically handled by many other sectors before being consumed. The bulk of commodities are handed to first-line handlers which include for-profit commodity trading companies, farmer cooperatives, or various companies that may wrap, wax, and pack certain food items. The byproducts from this sector are often used to feed livestock, and industrial processes (*A Frame for Assessing effects of the Food system*, NIH). The food products that are provided by the first line handlers are often passed to a wholesale and logistics sector. This sector consists of companies that purchase and store food products in a network of warehouse facilities.

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Ultimately, these products are then passed to the retail food and food service sectors which include convenience stores, grocery stores, vending machines, and other retail outlets that consumers may purchase food from.

How much food is wasted?

The vast majority of food waste ends up in landfills. Food waste is the most common item to be landfilled and incinerated in the United States (10 *Food Waste Statistics in America*, Igini). That adds up to about 40% of the entire food supply in the US (*Food waste in America 2023*, rts).

Food is not only lost from the consumers' end, it is estimated that about 20% of fruits and vegetables are lost during production, 12% at the distribution and resale level, and 28% at the retail level (*Food Waste in America: Facts and Statistics*, Rubicon). Seafood also faces a very similar fate. There are beneficial ways to handle food waste, but it is often not handled as such.

When food waste is placed in landfills and incinerated it is ending the food cycle and not allowing it to provide any real benefits.

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Where our waste comes from:



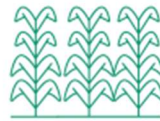
43%

homes



40%

restaurants, grocery
stores, food service
companies



16%

farms



2%

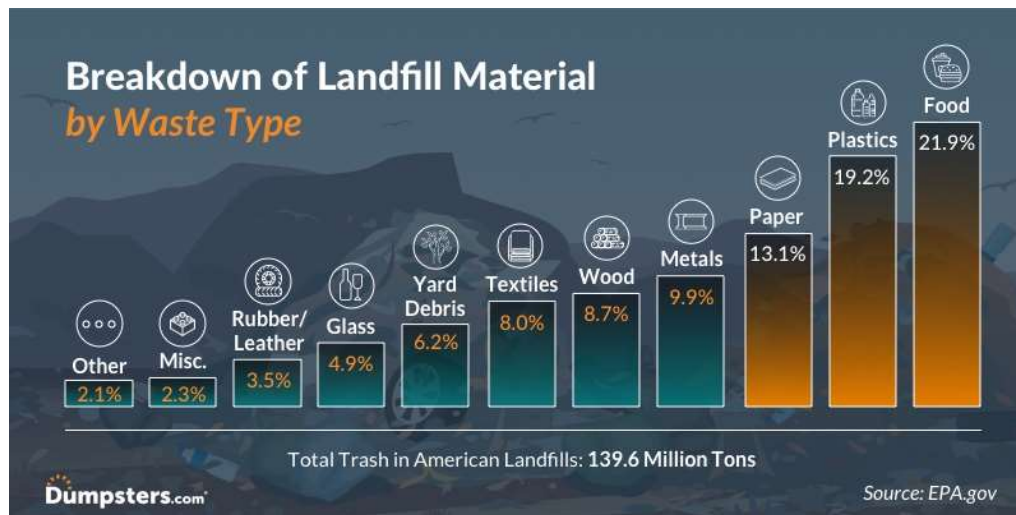
manufacturers

Environmental Impact

Landfills are not only wasteful but also cause a number of environmental concerns. Food waste is one of the biggest emitters of methane, a greenhouse gas that is about 28 to 30 more times potent than carbon (*Food Waste in America: Facts and Statistics*, Rubicon). Landfills rank as the third largest source of methane emissions from human activities, making them a significant contributor to climate change (*Quantifying Methane Emissions from Landfilled Food Waste*, EPA). Landfills also pose environmental issues such as destroying natural habitats, with the average landfill being about 600 acres (Vasarhelyi,2021). With the 3,000 active landfills, about 1,800,000 acres have been lost (Vasarhelyi,2021). Landfills also have the potential to contaminate nearby water sources when plastic and clay linings have leaks. This contaminated water has a high level of ammonia. When ammonia makes its way into the ecosystem, it can create nitrates that can then lead to ‘dead zones’ which are essentially areas where no organisms can live (Varahelyi,2021). It is clear that food waste and landfills are directly correlated, and solving the food waste issue would minimize the environmental impact of landfills.

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Alternatives to Wasting Food

It is important that the overall amount of food wasted is reduced, and the food that is wasted is used in productive ways. This can be done on both an individual and industrial scale. To reduce the amount of waste produced it is recommended that fruits and vegetables be stored properly. It is also good for households to plan how much of a food item they will need so they don't end up buying too much of it (Preventing *Food Waste at Home*, EPA). On an industrial scale, composting is a very beneficial way of dealing with large quantities of organic waste. It is important that this be implemented on a large scale because commercial composting can compost a much broader range of materials and do it at a much faster rate than an individual household. There are three main ways that industrial compost can happen. One of these is windrow composting where the organic material is arranged in long rows and turned regularly, being exposed to the ideal amount of air and moisture (*What is Industrial Composting*, 2022). Static pile composting works by mixing dry materials like wood chips with organic ones. It may also have pipes placed over it to stimulate airflow. Another type of industrial composting is IVC

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which is very different from windrow and static pile composting. The IVC process happens in a large vessel that measures and controls the temperature, moisture and oxygen levels. The IVC is an optimal method for decomposing smaller amounts of organic matter (*What is industrial composting*, 2022). Composting would be a very beneficial way of dealing with food waste as it not only reduces the amount of material that ends up in the landfill but it can be reused to provide nutrients to the soil, thereby reducing the need for chemical fertilizers.

Food Waste as an Energy Source

Many researchers are discovering ways to create new technologies that can use food waste to generate clean energy. One of these processes is something known as Biomass Gratification. This process aims to convert food and agricultural waste into a mixture of gases that can be used as fuel, also known as Syngas. (*Here's how food waste can generate clean energy*, 2022). Syngas has the ability to generate both heat and power. This process would be sustainable since it is a carbon-neutral form of energy (*Here's how food waste can generate clean energy*, 2022). If this process were implemented in farms, cities, and municipalities, they would be able to cut expenses. The use of Syngas would also reduce the need for landfills which would lower the operating budget for solid waste management (*Here's how food waste can generate clean energy*, 2022).

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Conclusion

In summary, food waste is a considerable issue in the United States and around the world, but there are many sustainable and productive ways to deal with it. It is a given that there will always be food waste, but if we can harness methods such as composting and biofuel, it can be made into something productive.

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