

# FOOD WASTE IN THE UNITED STATES

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**Abstract – Food waste occurs at every stage of production, storage, transportation, processing, retailing and consumer consumption. From storage to consumption a large percentage of food waste ends up in landfills which has no redeeming value but in fact has a negative effect on the environment.**

**Key Words – food, waste, landfill, composting.**

## I. INTRODUCTION

Food waste is hard to quantify since countries and organizations often use different classifications on what is waste but they all agree that the quantity is monumental.

They also usually agree that packaging material and paper accounts for the largest volume of waste and food is second or third. In the food category fruit and vegetables top the list and meat is a much smaller quantity but meat waste is criticized since it takes more land area and energy to produce per volume when compared to plants. Critics of meat do not take in account that a great percentage of this planet can only be harvested by animals and cannot be used for crops.

## II. MATERIALS AND METHODS

The Swedish Institute for Food and Biotechnology (1) and FAO 2011 (2) indicate that approximately 1/3 of edible food parts are lost per year, approximately 400-500 calories are lost per person per day. Approximately 40% loss occurs at postharvest and processing areas and 40% occurs at retail and consumer areas.

U.S. Food Loss

- Dr. Cathann Kress (3) estimates that in the U. S. each person wastes 200-250 pounds of food per year in an environment where 1 out of 8 people go hungry.
- 30-40% of food supply is wasted or approximately 20 pounds per person per month (5).
- Getting food from farm to fork uses approximately 10% of U. S. total energy and 80% of the total fresh water.

## III. HANDLING FOOD WASTE

Table 1 indicates the options for disposal of waste. Cooperative effort is needed by Producers. Government and Consumers.

Consumers

- Make a list before you go to the grocery store of what you need and only buy these products
- Buy only what you need and cook only what will be consumed
- If you over estimated needs you need to utilize leftovers
- Utilize product that are approaching “sell by date” or mis-formed fruit especially if the price is reduced
- Understand storage, packaging and temperature requirements and cook questionable products to “well done”.

Processors

- Donate unsalable product to social feeding stations
- Understand storage requirements and follow them
- Understand the ripening process and how it is influenced by temperature and the environment
- Reduce price if you have an oversupply
- Cycle unconsumed food product to compost instead of land fill.

#### Farmers

- Inspect for disease frequently and control insects and other pests
- Only grow crops that are suited for your area and only use seeds and or sprouts that are resistant to common diseases
- Donate unsellable product to local food banks or convert product to a processing system if the product is consumer acceptable

#### Cities

- Have a recyclable system, and send food and yard waste to a compost system.

Table 1 Options to handle waste

Waste Options	Advantages and Disadvantages
<b>Diverting leftover food and consuming this food</b>	The best option but it must be handled appropriately. Refrigerate as soon as possible and keep at room temperature for as short as possible. Keep out of 40-140 degrees F. as much as possible (never more than 4 hours)
<b>Landfill</b>	Worst option, Largest source of methane production and that from food is 6 times greater than all the other waste. ~ 21% of landfill is food waste
<b>Composting</b>	Second best option. Converting into fertilizer. Will also cause methane production
<b>Rendering (one of oldest recycling industries)</b>	Good option partially for meat products. Converts waste, often dead animals as well as harvested ones into useful products such as tallow, fuels, soaps, rubber, plastics, animal feed (due to BSE cannot be fed to cattle), fertilizer, etc. In 2004 produced > 8 million tons of product of which 1.6 mil. was exported (4). Excellent option but number of facilities is reducing
<b>Digesting</b>	Good option but equipment is costly
<b>Pet food</b>	Excellent option for nonhuman edible product
<b>Donation/Price reduction</b>	Excellent option- Leftover food - give to food banks or local feeding programs. If groceries have an oversupply reduce price before the food spoils. Cosmetic defect or approaching end of shelf life – reduce price to keep the product in the human cycle or into a processing route if edible

#### IV. OHIO STATE UNIVERSITY - PROGRESS

The Ohio State (4, 5, 6, 7) University offices as well as gathering places have bins for recyclable waste and non-recyclable waste. Uneaten food from the dining serves and kitchens (~60,000 students) will go through food pulpers and a specialized truck will pick it from multiple locations and it will be composted or go through a bio digester. The OSU Student Government lets students use remaining visits to their food facilities in the last 2 weeks of each semester to buy nonperishable food to be donated to neighborhood food service organizations. The Blackwell (University Hotel) and Schottenstein (basketball arena and used for other indoor events) and waste goes through a Grind2Energy machine which grinds the waste food which then goes to a holding tank and is hauled to a anaerobic digester which captures methane and the remaining material is used as fertilizer. The university also offers a service to events where waste can be deposited into 3 department bins (compost, recycling & waste).

The OSU football stadium (also used for other outdoor events) is one of the largest stadiums that holds over 100,000 people. The stadium is participating in the "Zero Waste Program" (diverting 90% of the trash from landfills) by recycling and composting. Bins are available but approximately 50% of the trash is left in the stadium. Navel cadets clean and sort this waste. The compost and recycling bags are transported to a processing facility where the contents are checked for the appropriate recycling pathway. Immediately after the event the leftover food from the concession stands and kitchens is taken to a food facility where it is evaluated for donation or composting where it is mixed with coffee grounds and manure, is then turned 4-6 times to introduce oxygen, which causes the temperature to increase to 140 degrees Fahrenheit. The Ohio State University also recycles chemical waste and electronic materials.

#### IV. CONCLUSION

It is obvious that food waste is a major problem in a food hungry world and landfills are not a desirable option. Leftovers, non-attractive food items, products approaching end of shelf life, overabundance of product with limited shelf life can be directed to charitable feeding operations or in many cases can have the price reduced or can be processed (canning, freezing, dehydration, etc.) which later can be used for human consumption. Product that is beyond human food desirability can be used for pet food, rendering or digesting etc. which will convert food including meat to useful products such as animal feed, oils, fertilizers etc.

#### REFERENCES

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