

# Fighting Food Waste Through Community Composting

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## Abstract

Since the 19th century, Earth’s average surface temperature has risen 2 degrees Fahrenheit due to an increase in the pollution of greenhouse gases caused by human activity (NASA n.d.). The magnitude of food waste produced in the United States contributes to climate change through the methane released by the excess food discarded in landfills. Each year, 40 percent of food in the United States is never consumed due to food loss or waste along the supply chain by growers, consumers, retailers, and restaurants (USDA n.d.). However, millions of Americans are food insecure or live in areas known as food deserts that have little access to fresh food. Recent estimates suggest 690 million people around the world went hungry in 2019 (UNICEF 2020). For food systems to operate more sustainably, we must promote food recovery processes (*Figure 2*), one of which is composting. Our group has partnered with Roy Pope Grocery to collect composting material and deliver it to the UNT Health Science Garden, where it is weighed, processed, composted, and later used in gardening plots. Through composting, we are able to limit the amount of greenhouse gases emitted in the air, in turn, fighting climate change and preventing its negative impacts on Earth’s ecosystems. We are analyzing four months of food waste via descriptive statistics and the EPA’s Waste Reduction Model (EPA n.d.).

## Purpose Statement

The purpose of this research is to first quantify the amount of food waste produced and then diverted from landfills through a community composting program in Fort Worth, Texas.

## Research Question

How much food waste from one grocery store can be prevented from reaching the landfill through composting and what are the benefits?

## Methods

We gathered food waste from Roy Pope Grocery which consisted of mostly vegetables and fruits as well as eggshells and coffee grounds. After collecting it in buckets it was taken to the UNT Health Science Community Garden—composting facility. There we weighed each bucket (*Fig. 3a*) and recorded the weight and contents in a form (*Fig. 3b*). Then the contents were deposited into the compost bin (*Fig. 3c*), along with leaves placed on the top (*Fig. 3d*) for it to begin its decomposition process. The food waste acts as a nitrogen source and the leaves and other brown materials as carbon for the microorganisms involved in the decomposition process to survive and grow. Then we calculated the total amount of food waste diverted from the landfill over the course of the project. Some of the food waste did not go to the compost bin as we determined it could still be used by humans or animals. We computed descriptive statistics (*Figure 1*; *Figure 4*) for the food waste including type of food waste and exported the total amount into the EPA’s WARM (Waste Reduction Model) tool. The WARM tool calculates the carbon dioxide equivalent in metric tons that is prevented from entering the atmosphere through alternative waste management practices including composting (*Figure 5*).

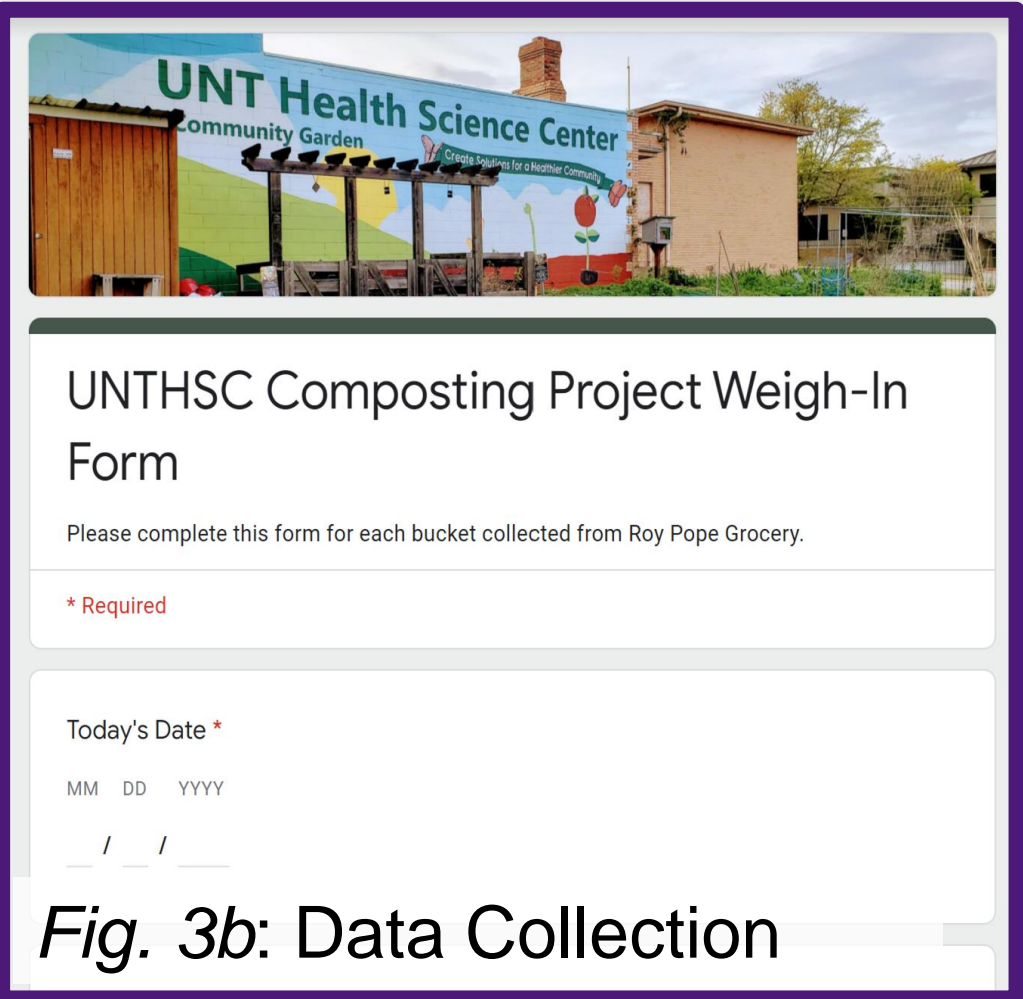
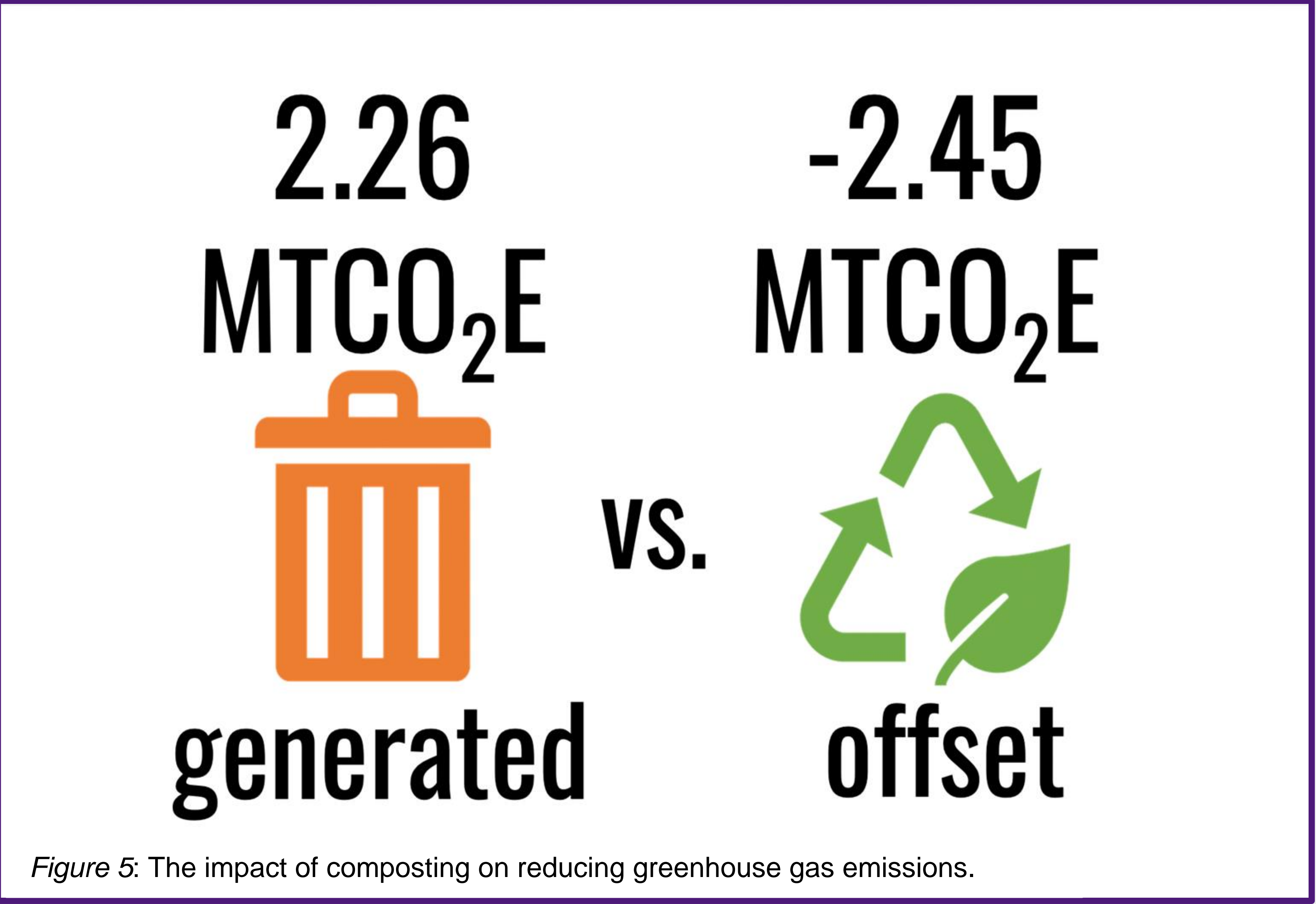
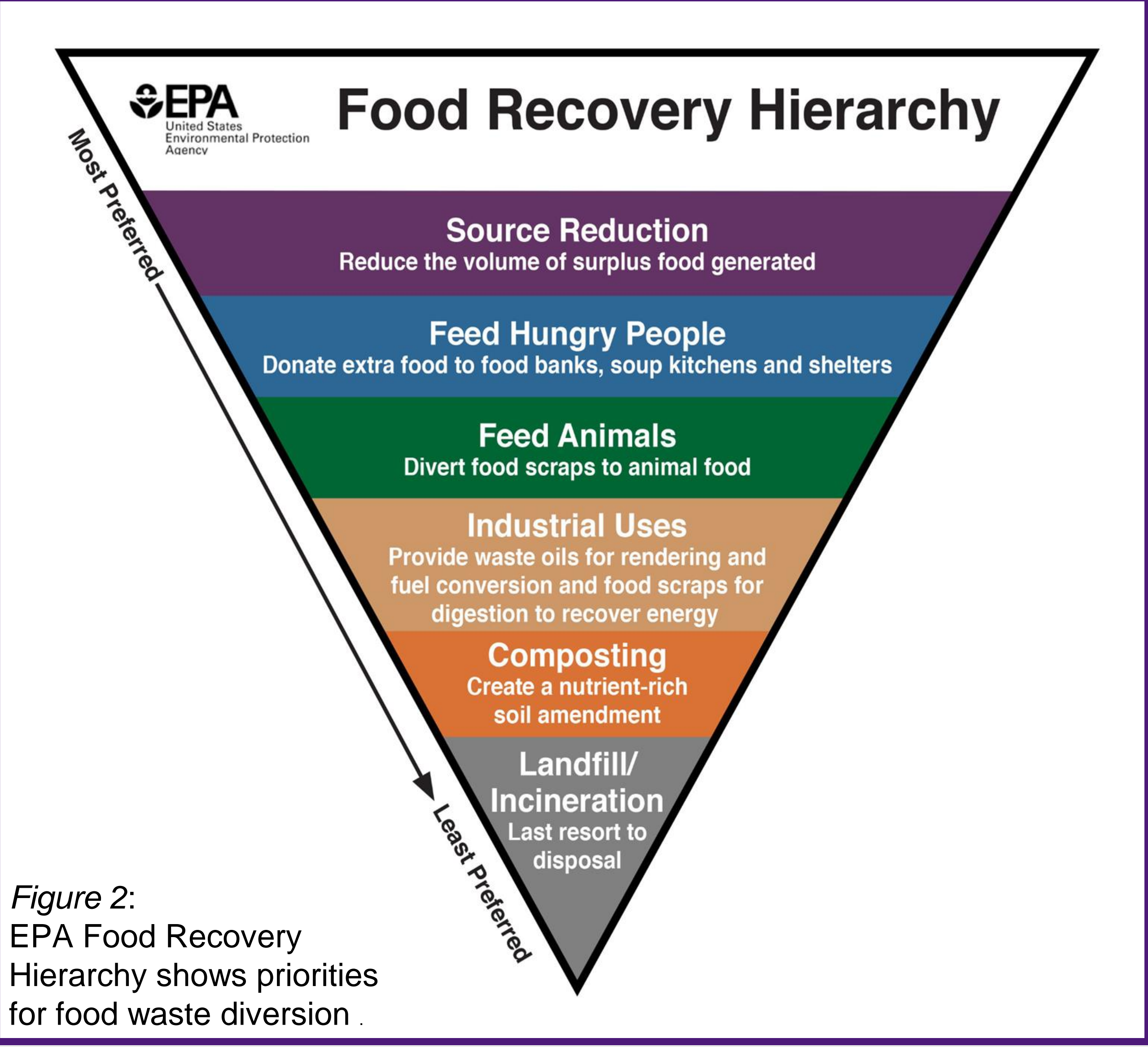
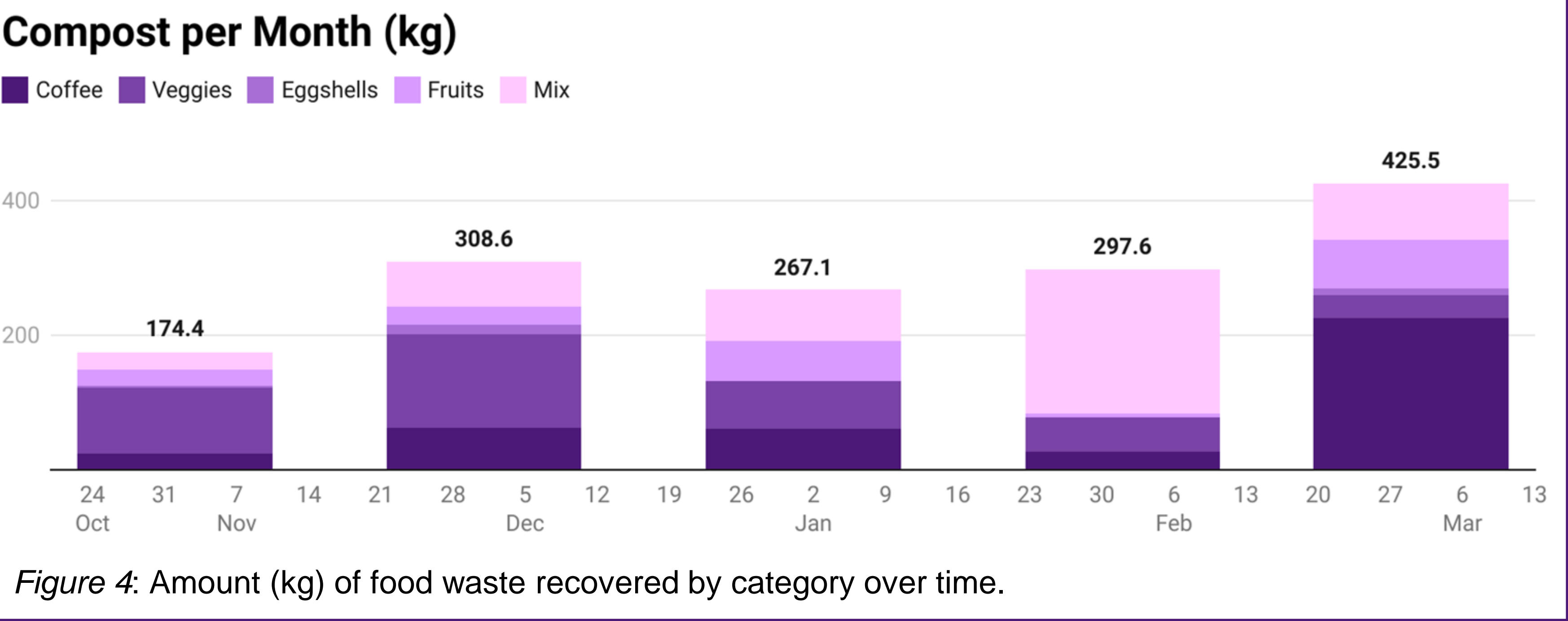
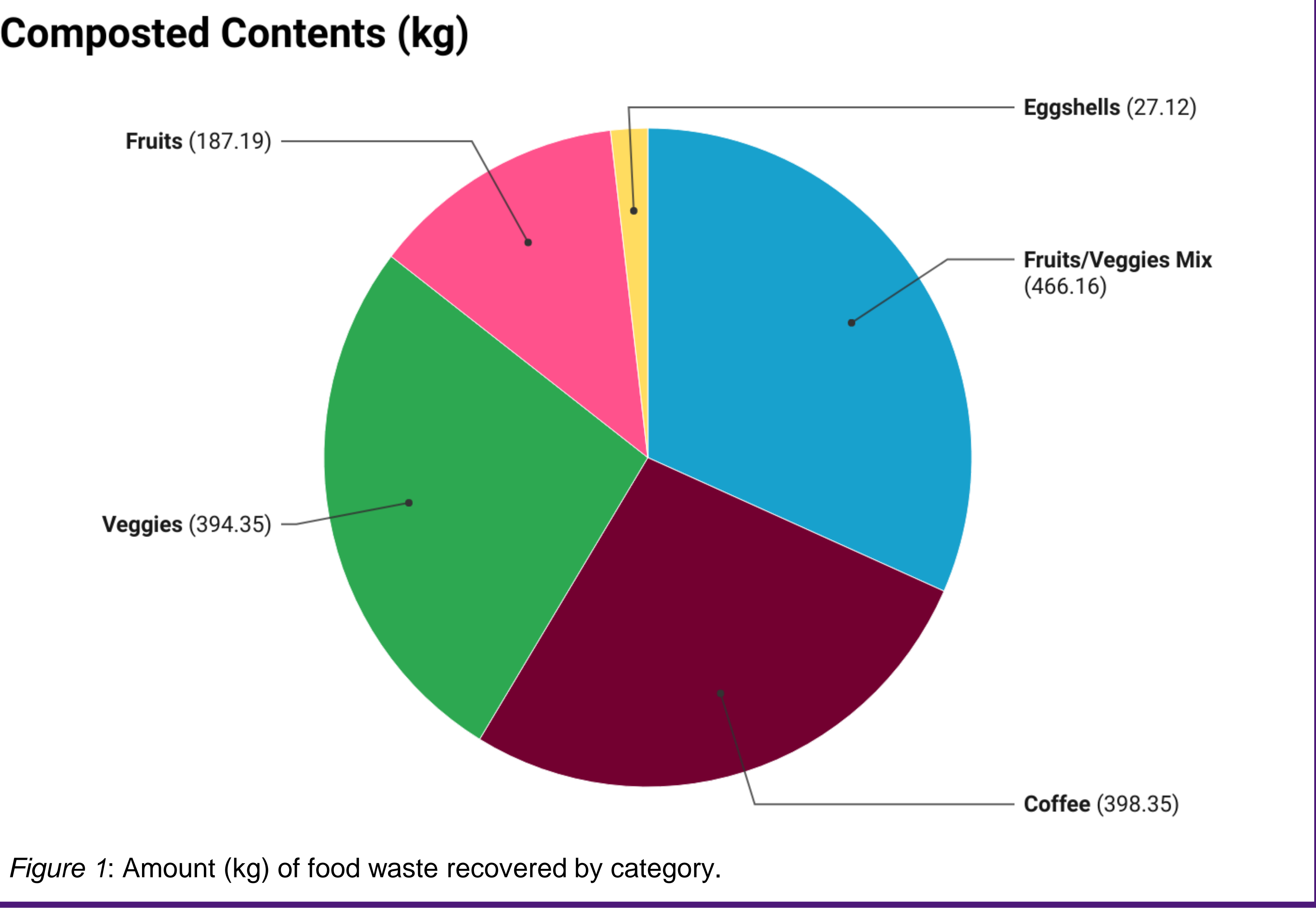


Figure 3: UNT Health Science Center Community Garden composting facility.

## Results



## Discussion

In cooperation with Roy Pope Grocery and volunteers from the UNT Health Science Community Garden, the TCU Composting Crew diverted 1473.17 kg of food waste from landfills, preventing the food from undergoing anaerobic decomposition that releases the greenhouse gas methane. According to the EPA’s WARM tool, composting prevented 2.45 MCO<sub>2</sub>E (*Figure 5*), or carbon dioxide equivalent, from entering the atmosphere. This number includes offsets from transportation and food waste diverted from the landfill. CO<sub>2</sub>e is a standardized metric that shows the global warming potential of non-carbon greenhouse gases (EPA 2019). Gardeners use the compost in their individual garden plots and a portion of their harvest provides food to the Fort Worth community. In future research, we plan to examine other parameters such as temperature of the compost. We are also interested in expanding the composting program to include other area suppliers and facilities that could receive the compost. In addition, while this program has community and climate benefits, composting is low on the food recovery hierarchy (*Figure 2*). We plan to recover edible food waste from Roy Pope and other suppliers for human and animal consumption. Finally, we encourage Fort Worth residents to help prevent food loss and food waste by only purchasing what they need, buying local and in-season products, and donating what they do not plan to consume.

## References

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## Acknowledgments

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