
GSU Waste Reduction

Georgia State University

Essay:

> Introduction
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> Food waste is a significant issue in university dining halls, with an estimated 22 million pounds thrown out by college campuses nationwide (Food Recovery Network). Drawdown Georgia estimates that over two million tons of food is wasted in Georgia every year; they identify food waste reduction as a top climate solution.
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> Georgia State University is committed to maintaining sustainable operations in our dining halls. All three of our dining halls were awarded the prestigious 3-star green certification from the Green Restaurant Association based on the categories of disposables, energy, food, furnishings and building materials, pollution and chemical reduction, and waste and water use.
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> We utilize the Food Recovery Hierarchy to help us divert our food waste. The Food Recovery Hierarchy is a pyramid strategy created by the Environmental Protection Agency detailing approaches that divert and minimize food waste generated by organizations. Approaches listed from most preferred to least preferred are source reduction, feed hungry people, feed animals, industrial uses, composting, and landfill/ incineration. Georgia State University has made it their priority to follow the hierarchy by implementing projects that fall under the most preferred approaches.
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> Source reduction:

In 2024, GSU deployed Raccoon Eyes, an innovative tool that has made a significant impact in reducing post-consumer food waste in all three dining halls. Racoon Eyes uses AI and computer vision to detect and measure the type, weight, and cost of food scraps that have been left on consumers' plates – effectively providing a real-time food waste audit every day for every single plate returned via the conveyor belt. This data is combined with consumer sentiment data to create a fuller picture of the cause of food waste. This tool has provided insight and innovative ideas that have contributed to a significant decline in post-consumer food waste in one year alone. Recommended solutions include reducing portion sizes, providing smaller utensils, and changing recipes to decrease the food wasted by consumers.

GSU uses LeanPath, a back-of-house food waste prevention tool that tracks kitchen food waste and helps dining managers reduce food waste through training and monitoring. Since implementation in 2011, GSU has decreased their pre-consumer food waste by 278,540.8 lbs, or 49%.

To minimize our landfill waste, we are plastic straw-free and use reusable plates, cups, and utensils. By eliminating trays in our dining halls, we reduce water, food waste, and conserve energy. Instead of Styrofoam takeout containers, we provide 100% recyclable OZZI containers to students. Each OZZI container is labeled with a sticker from Fill It Forward, a program designed to measure and incentivize usage of reusable items. Fill It Forward tracks the number of times a container is returned and donates $0.02 to an environmental charity every time consumers scan their QR code.

Feed hungry people:

Georgia State University actively supports food rescue efforts through its Pantry Plates program. The program works by recovering surplus pre-consumer food from Georgia State's Panther Dining facilities. The rescued food is then prepared and portioned into single-serve microwavable trays, ensuring that each meal is both convenient and balanced. Once prepared, the meals are distributed to the Georgia State community through Panther's Pantry, making them accessible to students, staff, and faculty who may be experiencing food insecurity. In FY 2024, we collected and donated 505.45 lbs of food.

The "Leafy Green Machine" is Georgia State University's hydroponic farm located inside a shipping container. The freight farm grows crops such as lettuce, tomatoes, cucumbers, spinach, and herbs that go straight to our dining halls, catering, and Panther's Pantry. It produces greens year-round.

Industrial uses:

Used cooking oil from GSU's dining halls is collected in bins and picked up by Clean Energy Biofuels, the only cooking oil service company and biodiesel producer in the southeast. The cooking oil is processed into biodiesel fuel, a renewable fuel source that can be blended with traditional petroleum diesel for automobiles, trains, homes, and power generators.

Composting:

All food scraps generated in our dining halls are composted. First, they are processed using SOMAT food grinders, which are strategically installed in high-waste areas such as food prep and pot-and-pan washing stations to capture waste at the source. The SOMAT system processes food waste by extracting, pulping, and compacting the scraps into a confetti-like mixture, reducing the volume and weight by up to 80%. The processed scraps are then sent to Closed Loop Organics, where they are transformed into compost. By reducing the volume of food waste prior to pick-up, we are able to reduce the frequency of hauling needs, which directly correlates to lowered emissions by our vendor.

The composting program at GSU operates in all three dining halls and accepts pre- and post-consumer food waste as well as compostable alternatives to single-use plastics. To ensure proper post-consumer composting, trash cans are intentionally absent from the dining hall floors. Instead, students place their plates with leftover food on a conveyor belt that transports them to the dish washing area. There, dishwashers sort the waste into designated bins for processing by our SOMAT grinder, to be turned into a more efficient compost by Closed Loop Organics.

Creativity & Innovation

Raccoon Eyes is the first AI food waste management system of its kind for post-consumer food waste. Georgia State University was the second university in the country to implement this innovation. Raccoon Eyes utilizes advanced computer vision and AI technology to measure and analyze food that consumers dispose of, identifying the type and calculating the

weight and cost of the discarded food. This innovative system also allows individuals to provide feedback on why they didn't consume the food through an interactive monitor, promoting behavioral change in consumers.

The data collected is invaluable for dining halls, as it helps them identify trends and implement the most effective strategies to reduce food waste, such as reducing portions or changing recipes. The innovation provides extensive data and graphs on the software dashboard along with recommendations for dining staff.

This innovation was implemented at Georgia State by two GSU Sustainability Initiative student-interns through a grant funded by the GSU Campus Sustainability Grants program. Aside from the food waste mitigation benefits, implementing the tool at Georgia State shows the university's interest in innovation to students, faculty, and prospective students who visit the dining hall. The implementation of this innovation will help spark students' passions and interests in sustainability, entrepreneurship, and technology, as well as provide a strong relationship with a young company on the forefront of sustainability innovation. This will bring about a generation of leaders in the growing public and private sustainability sectors. As an interactive innovation, Raccoon Eyes teaches students about AI software and engineering alongside sustainability topics.

Low Start-up Resource Costs/High Return on Triple Bottom Line

In early 2024, Georgia State University implemented Raccoon Eyes in all the Dining halls on a pilot basis to evaluate the tool's ability to drive a reduction in food waste by addressing consumer behavior. By the end of the four-month trial period, we had recorded an average of 23% reduction in food waste per plate. In February 2025, we compared food waste data for that month with February data for 2024 and saw a 31% reduction in total food waste compared to the previous year – a saving of 2,678 pounds across the two comparable months.See the Waste events have also demonstrated significant food waste savings – with the second event showing a 54.7% decrease in food waste collected.

The Raccoon Eyes tool has been shown to be an effective tool for food waste mitigation, prompting its long-term implementation in all three dining halls in the 2024 Fall semester. Going forward, we expect to maintain and see continued improvements in food waste reduction through recipe and portion changes, educational events, messaging, and research on the effectiveness of different solutions.

Applicability of Initiative

The Racoon Eyes tool has started to be implemented nationwide on school campuses, with campus size ranging from elementary schools to top universities. The initiative provides campuses with the option to choose from a trash can or conveyor belt. The relatively low start-up cost (approximately $5,000) allows this innovation to be implemented through student fees or grant programs. This could also be applicable in a range of commercial settings, such as nursing homes, hospitals, and restaurants.

Effectiveness of Measurement

The Raccoon Eyes system uses AI and computer vision to estimate the type, weight, and cost of food waste on each plate. This data, along with student feedback from the Raccoon Eyes monitor, is made available on the dashboard through graphs and charts and updated bi-weekly. Food waste audits are a gold standard for evaluating food waste. Typical food waste audits are time and labor intensive, making it only possible to conduct them intermittently. Racoon Eyes provides a constant, daily food waste audit with real-time information and timely lessons learned.

Since implementation in January 2024, the initiative has resulted in a 22% decrease in food waste per plate at Georgia State University's largest dining hall. As the number is based per plate, this accounts for variability in the number of students eating in the dining hall every day. The cause for this reduction is from the awareness of food waste that the monitor projects and the psychology of students seeing cameras tracking their waste. Both methods have been researched and are proven to reduce waste through consumer awareness and psychological nudging.

Education, Outreach, and Marketing/ Communications

In a series of events, student interns in the dining halls collect the finished plates of all students from 11-2pm, sorting their uneaten food waste into trays located in front of the dining hall conveyor belts. Food waste is then displayed until the dinner service, allowing students to see a visual example of their food waste. Students are also able to guess the weight of the waste

at the end of the lunch service for a chance to win $50. Four "See the Waste" events have engaged thousands of students during the lunch and dinner services. 832 students signed up to guess the weight of the lunch services' food waste and entered the giveaway. The events resulted in about a 50% decrease in food waste at one of the dining halls. The "See the Waste" event Instagram posts totaled 7,042 views and 310 interactions. Our "demure and mindful" food waste reduction post generation over 14,000 view. Various other posts about GSU sustainable dining initiatives exceed 700 views.

Along with in-person events, Instagram posts and stories are made to gain feedback from the students directly. Instagram story polls tagged, "#FeedbackFriday", are made in collaboration with the GSU Dining Instagram account, allowing students to answer questions regarding the top wasted foods, such as chicken, fruit, pizza, fries, and dessert.

In September 2024, members of GSU's Sustainability Office were featured in an ABC News Live Prime with Linsey Davis segment to discuss the impact of Raccoon Eyes in our dining halls. The segment aired nationally, and garnered thousands of views on streaming channels and social media.

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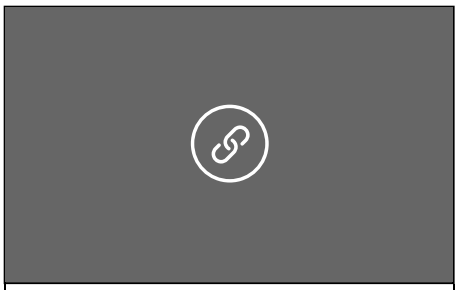

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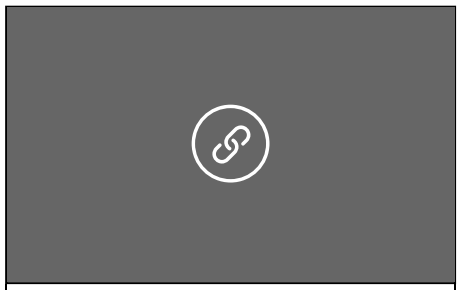

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