

# Investigation of Food Waste Reduction Practices at UCSD

## Renu Singh, Dr. Keith Pezzoli (University of California Global Food Initiative Fellowship)

### INTRODUCTION

According to the EPA (EPA Environmental Impact of US Food Waste), over 33 million tons of food reached landfills in the U.S, which makes up a little over 20% of total waste (1). Moreover, food leftovers are the single contributor to this waste by weight (2).

Food waste is a significant financial and environmental burden, costing the food industry \$100 billion each year as well as generating millions of metric tons of gas emissions (3). Another main concern is the problem of meeting a growing demand for food world wide. Globally we waste enough food to feed four times the number of food-insecure people. In San Diego alone, only 5% of the total food waste amount is needed to meet the needs of local food banks and programs directed at the food insecure (4).

While UCSD has been one of the leading universities in sustainability, the college has put a larger focus on food in the past 10 years resulting in exciting milestones for food sustainability.

Currently, HDH does emphasize reduction and recovery of pre-consumer waste by prepping on-site, cooking from scratch, tracking uptake and production, and most importantly, off-site composting. The student-run Food Recovery Network (started in 2015) recovers food from the dining halls and onsite farmer market to donate at the new UCSD Food Pantry or local non-profits.

However, there is little done on the post-consumer side to reduce and recover food waste coming directly from students. HDH currently has no exact information on the amount of waste generated by students and while a few student groups and staff are dedicated to the cause, a majority does not realize the urgency and gravity of this issue. So although post-consumer waste is the lowest level on the food chain hierarchy, tackling this issue through tracking and student awareness will not only reduce the university's overall waste significantly, but it will also increase awareness for increased involvement in sustainability.

### PROJECT GOALS

Because there is little emphasis on post-consumer waste, the project investigates food waste generated by students and best practices for waste reduction at UCSD.

The original vision of the project was to utilize the university's dining halls as separate experimental groups to test the effect of certain practices on the amount of food waste generated by students. However, after talking to my mentor Dr. Keith Pezzoli, and Krista Mays, the HDH Sustainability Manager, I narrowed down the scope of the project to include a waste audit of one of the six dining halls on campus, Pines, and a best-case analysis of food waste reduction practices of at other universities and institutions.

By tracking post-consumer waste and researching best food waste reduction practices in the dining halls, the project aims to:

- determine exact amount of student food waste and provide a baseline for further measurements
- increase student awareness about personal waste in order to increase long-term interest and involvement in sustainability initiatives
- continue work with HDH and dining halls to possibly implement some of these practices and see change

### PROJECT PLAN

After meeting with Krista Mays, the HDH Sustainability Manager and learning about the dining hall practices already established in the kitchen, I understood the need for a larger emphasis on post-consumer waste. Because the initial plan to being experimenting on dining halls was too ambitious, a series of phases was planned for the project:

- Phase 1:** Incognito waste audits for baseline measurement
- total food waste from 100 students' plates were collected and measured at Pines
  - conducted during peak breakfast, lunch and dinner hours (9/9:30pm, 12/12:30pm, 5/6pm) throughout 1 month



- Phase 2:** Survey to determine what and why
- qualitative assessment of what foods were commonly being thrown away to provide feedback to kitchen
  - Understand common reasons why students are throwing away certain food items

- Phase 3:** Implement practices and measure efficacy
- phase in one practice in each dining halls and measure change in waste
  - post motivational/eye-opening signs, go trayless, feedback on waste after each day, all food waste on display in clear bins

Because the goal of Phase 1 was to obtain baseline measurements, the waste audits were as "incognito" as possible, simply asking students to scrape food waste into a collection bucket. Phase 2 and Phase 3 include more interaction and feedback with students to increase student awareness in the hope of reducing food waste.

### BEST CASE ANALYSIS

#### What Pines is doing right:

- salad/fruit bar is self-serve, only take what they need
- meat and pasta station separate sides from main meal, allow for choice
- signs to separate food waste, recyclables, and trash (although mostly ignored)
- dining-dollar style discourages ordered more than enough food

#### Suggestions based on case studies (corresponding to observed issues):

- serving all dishes with options for sides and toppings (P1)
- allow pricing for half portions (P2)
- smaller plates and going tray less discourage ordering excess food (P2)
- reusable to-go containers (P2)
- "taste" – offer food samples reduce chance for dislike (P3)
- "just ask" policy – customize meal (P3)
- standardized feedback – source reduction (P3)
- educate students on importance of food waste through signage and formal programs

### FUTURE GOALS

The scope of project investigation was severely limited by time, man power, and higher management. Waste audits with more students and at multiple dining halls over time would provide better estimates on the total food waste occurring on campus. One suggestion is for dining halls to perform periodic waste audits in order to track and understand how the amount of waste evolves over time.

Furthermore, because Phase 1 and 2 provide a baseline for post-consumer food waste, implementation of Phase 3 would be able to investigate the best practices to reduce this waste. Testing different practices at the 6 dining halls would not only allow us to compare certain the best possible practices, but also raise student awareness and increase involvement in this issue.

### WASTE AUDIT RESULTS

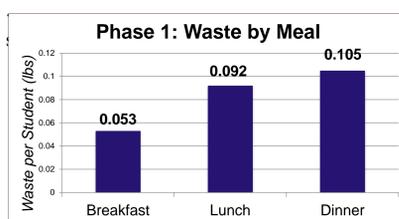


Fig 1. Average waste per student. 300 plates were measured for 3 different meal times (waste from a total of 900 students)

#### Extrapolated Waste Estimates

	Students	Estimated Waste (lbs)
<b>Breakfast</b>	357	19
<b>Lunch</b>	649	60
<b>Dinner</b>	482	51
<b>1 Day</b>	5147	427
<b>1 Year</b>	751462	62371

Fig 2. Based on random busy day (11/18/15). Meal times are 9am, 12pm, 5pm respectively.

**Phase 2:** The most common reasons for waste were unwanted toppings or sides (1), excess food (2), and distaste for the food item (3). Examples include the following:

- 1) Mexican food such as burritos and tacos always come with a side of chips and pickled corn/pepper.
- 2) The noodle station only serves one size, a huge bowl that can make up to 2 meals.
- 3) The pasta and pizza can end up being too oily for some people's tastes.

**Phase 3:** Need more time to gather baseline data for multiple dining halls, coordinate with multiple managers, and gather more volunteers to perform waste audits.

### LITERATURE CITED

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