Chapter 7: Residence Life Dining Services

7.1 Introduction

This chapter of the Chapman University 2016 Waste Management and Dining Services Audit analyzes the patterns of pre- and post-consumer waste at Randall Dining Commons, the primary residence dining hall on campus. Pre-consumer waste refers to the food that is delivered to Randall and handled by Sodexo Restaurant Services staff but never reaches the consumer. Post-consumer waste refers to the food that is received by students dining at Randall Dining Commons, but remains uneaten. This chapter focuses solely on sustainability and waste practices at Randall Dining Commons. See Chapters 5 and 6 for sustainability assessments of on-campus dining locations.

The Weigh the Waste event measures the dining waste produced by students eating at Randall Dining Commons. The leftover food is collected, weighed and displayed for educational purposes. The data gained from the Weigh the Waste events is the most comprehensive data available for monitoring Chapman's post-consumer waste. Other programs, defined in 7.2.2., that aim to reduce post-consumer waste include the cafeteria's Meatless Mondays and the Just Ask Initiative. Informative data concerning the current state of waste production, as well as data dating back to 2012 when the Weigh the Waste program began at Chapman, are also discussed.

Part of kitchen waste includes food scraps, which contribute heavily to the total waste generated by college campuses. However, many may overlook how much food waste is actually edible. In fact, college students generate 22 million lbs. of edible food waste each year ("Policies and Practices," 2015). This is food that is perfectly safe for consumption. According to Recycling Works, the average college student living in residential halls generates 0.35 lbs. of waste per meal, which is equivalent to 142 lbs. per student, per year ("Food Waste…" n.d.). At Chapman, about 2,000 students live on campus, meaning that each year residence life students are anticipated to produce about 128 tons of food waste ("Community…" n.d.). Assuming the average African elephant weighs about 5 tons, Chapman is throwing away, in food waste, the equivalent of 25 elephants per year, and this figure only accounts for post-consumer waste.

This chapter also investigates ways to prevent pre-consumer kitchen waste generated by back of the house food service operations. By surveying the student body to find out approximately how much of each food group students consume per day, unnecessary food waste due to over-ordering can be eliminated. Lastly, in order to make informed recommendations, this chapter explores the methodology behind current Randall Dining Commons operational procedures. Some of these procedures include:

1) *A la minute* food preparation
2) Food purchasing

3) Gathering student preferences
4) Utilization of Lean Path technology
5) Station operational hours

The purpose of gathering this information is to evaluate current Chapman Restaurant Services, managed by Sodexo, operational procedures and educate Chapman students, faculty, and staff about current Sodexo practices. Increased understanding of these practices will help improve relations between Sodexo and university stakeholders. Furthermore, accurately predicting the food choices of students, faculty, and staff eating in Randall Dining Commons will reduce pre and post-consumer waste because less unwanted food will be served. In addition, with the help of current Sodexo managers Eric Cameron and Dustin Fitch, Executive Chef Jim Douglas, and Sustainability Manager Mackenzie Crigger, fully informed food waste reduction recommendations can be made and implemented as a coordinated effort between Sodexo and Chapman stakeholders.

7.2 History of Randall Dining Commons Operations and Waste Management at Chapman

7.2.1 Overview

In 2009, Randall Dining Commons opened. It is located on the first floor of the Sandhu Conference Center in the Residence Life area. It is open to the entire Chapman community, and it is the primary food service location for campus students. Currently, it features six dining stations:

- American Station
- Asian Station
- European Station
- Italian Station
- Sandwich Station
- Vegan Station

Figure 7.1 *Images of Randall Dining Commons*

7.2.2 Past accomplishments

Post-Consumer Waste:

Several programs have been put in place to combat the issue of post-consumer waste, but there is room for improvement in each of these programs. The Weigh the Waste program, which is the most prominent tool for awareness employed in Randall Dining Commons, was introduced in 2012. To this date, the Weigh the Waste program educates students by allowing them to visualize just how much food is wasted over the course of one lunch period.

Randall Dining Commons also has a voluntary Meatless Monday program. Although meat is still served every Monday, students are encouraged through the use of informational posters to abstain from eating meat. In addition, students can take the Meatless Monday pledge, located on the Chapman University website, to commit to "not eat meat on Mondays and eat a more plant based diet for the good of the environment and [their] own health" ("Meatless Monday Pledge," 2016). From an environmental perspective, it is important that students decrease their meat consumption in order to combat climate change. Animal agriculture is responsible for 18% of all global greenhouse gas emissions, causing more pollution than all transportation, which amounts to 13% of emissions ("The role of livestock…" 2016). The major ways that animal agriculture produces greenhouse gases include the production of feed, enteric fermentation from the process of animal feed digestion, manure handling, and energy use in farming facilities (Röös et. al., 2013).

While Americans are told to eat meat because of its high protein content, raising beef is the least efficient way to produce protein due to the amount of resources that are used, the waste that is generated, and the consequential greenhouse gases that are released into the atmosphere. In addition, many vegetables, including green peas and kale, are not recognized for their high protein content (Carlsson-Kanyama and González, 2009). While wheat and dairy products typically release higher quantities of CO_2 than fruits and vegetables, meat products, by and large, have the biggest carbon footprints (***Figure 7.2***).

Product	CO_2 (kg) for every 1 kg of product
Wheat	0.8
Milk	1.3
Poultry	1.6
Pork	2.5
Beef	16.0-30.0

Figure 7.2. *The greenhouse gas emissions associated with the production of 1 kg of various food products ("Growing Greenhouse..." n.d.). Note that CO_2 represents CO_2 equivalence, which expresses emissions in terms of units of CO_2 although CO_2 may not be the only greenhouse gas released.*

Students may also utilize the Just Ask Initiative, which allows them to customize orders to meet their dietary needs and desires, in addition to vegan and vegetarian options. For example, rather than take a prepared plate full of food, students can ask for a specific food item, thereby reducing waste. In cutting down portion sizes and providing students with food that requires fewer resources to produce, both of these programs lower the environmental costs of food waste. The dining commons also boasts Xpress napkin dispensers that reduce inedible post-consumer napkin waste by 25% because they prevent diners from grabbing more than one napkin at a time ("Tork Universal Xpressnap…" 2015). One last notable achievement was the decision to remove trays from the dining commons in 2007, thereby reducing the likelihood that students grab excess amounts of food and reducing the amount of water used to wash dishes.

Lean Path:

According to the Chapman University 2013 Environmental Audit, Sodexo employee Jennifer Harris vouched for the food waste reduction resulting from the Lean Path Program: "The Lean Path has significantly reduced pre-consumer kitchen waste, measuring a reduction of 48.22%. That is almost 50% less food going into the waste stream, allowing more accurate amounts of food to be prepared for the Chapman Community" ("2013 Campus Sustainability…" 2013). However, these measurements were taken during the short time span of Fall 2012 - April 2013. Sodexo Manager Eric Cameron has expressed concerns about Lean Path's feasibility and accuracy in current operations at Chapman.

7.3 Current Status

7.3.1 Operational Procedures

This section addresses various Sodexo procedures that contribute to the generation of or alleviate food waste in Randall Dining Commons.

A La Minute Food Preparation

A La Minute food preparation refers to the practice that Sodexo chefs currently employ when preparing food in Randall Dining Commons. This method is effective at reducing post and pre consumer kitchen waste because meals are prepared on the spot for student demand. No more than 10 plates of food are cooked at one time. This means that at the end of the dining period virtually no food cooked for student consumption is wasted. Any food not utilized for that meal can be saved for future meals because it was not cooked. The only food wasted is at most the 10 plates that were cooked during the last rotation. However, Sodexo has eliminated even more of this waste by stopping the preparation of hot meals fifteen minutes prior to the end of the hot food period. This means as the last few students trickle in they can take food cooked in the final rotation until the food runs out. No additional food will be prepared at the end of the dining period ("Environmental Operations Informational Meeting", 2016).

Lean Path

Currently the Lean Path waste management system at Randall Dining Commons has two severe flaws. Firstly, there is only one Lean Path tracker for the entire Randall Dining Commons. This makes it impossible for every station to weigh and track the waste without significant disruption. Secondly, the use of these stations has not been integrated into the operational preparation procedures. To do this would require additional training for all Sodexo staff working with food and managerial support to ensure the process become integrated into the organization's culture. Eric Cameron noted that the kitchen staff is already trained to reduce waste and that any further measurement of this waste might be unnecessary. According to Cameron, Executive Chef Jim Douglas is responsible for supervising his employees' scrap buckets and making sure they are maximizing the utility of the food. It was implied that utilizing the only Lean Path tracker currently available would be redundant and intrusive to their current operational system unless more trackers were purchased and utilizing the system was made more convenient ("Environmental Operations Informational Meeting", 2016). If Chapman was to consider purchasing additional Lean Path trackers for the Randall Dining Commons, it would be important to assess the cost, which is why the Lean Path 360 cost table is shown in ***Figure 7.3*** (""Pricing | LeanPath",2016).

	LeanPath 360 TRACKER 2.1 HARDWARE + SOFTWARE SUBSCRIPTION		
Edition	SMALL BUSINESS	PROFESSIONAL	ULTIMATE
Pricing	$399/month	$599/month	$749/month
Includes Tracker 2.1 Unit (1)	●	●	●
Includes Reporting User Seat (1)	●	●	●
Can Link Multiple Locations	●	●	●
Tracking Customization	Operator Names, Containers, Food Costs	Operator Names, Containers, Food Costs, Food Types, Disposal Method, Express Transactions	Operator Names, Containers, Food Costs, Food Types, Disposal Method, Express Transactions, Loss Reasons, Pre- vs. Post-Consumer
Advanced Reporting		●	●
Build Your Own Custom Reports			●
Weekly Waste Summary Email	●	●	●
Custom Waste Alerts	2/user	4/user	6/user
Waste Reduction Coaching Hotline		●	●
Data Review Sessions		1/year	4/year
Proactive Coaching Support			Ongoing
Technical Support	Email	Email/Phone	Priority Email/Phone

Figure 7.3 *2016 cost table for purchasing one Lean Path Tracker and subscription.*

Collecting Student Preferences:

Establishing efficient methods for collecting accurate data regarding students' wants and needs is important for reducing pre and post-consumer waste in Randall Dining Commons because less food will spoil before student consumption or be wasted by students during each meal. Additionally, satisfaction ratings will improve, increasing the profitability of the entire operation. These additional profits can then be utilized to support environmentally friendly initiatives throughout all of Sodexo's operations.

In the 2016 Chapman University Environmental Survey, students were asked if they knew how to provide feedback to Sodexo with regards to their dining experience. The results show that 44% of the respondents are unaware of the avenues available to them for submitting preferences. After receiving this result, another question was posed during the 2016 Earth Week Smoothie Workshop event hosted in Randall Dining Commons regarding which communication method (Facebook, Twitter, phone applications, in person, email, or other students) would be easiest for students to use to share food preferences with Sodexo. Results show that the most popular form of communication was in person at 47% and the second most popular was Facebook at 27% (***Figure 7.19***, located in the appendices).

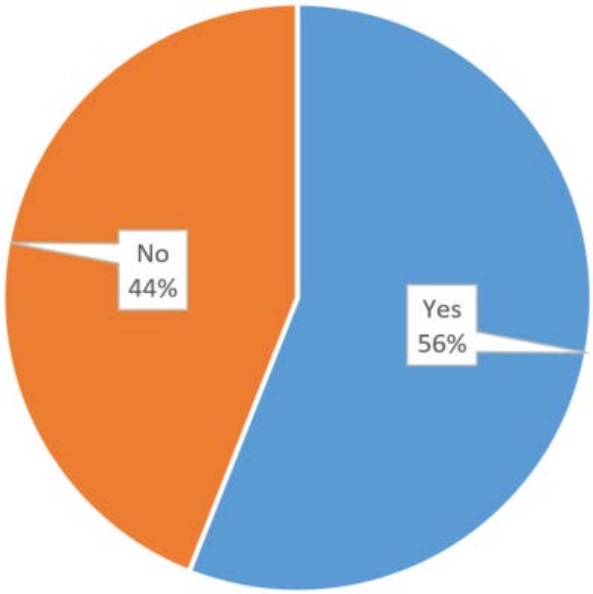

Figure 7.4: *Results from the 2016 Chapman University Environmental Survey in response to the question: "Do you know that you can leave suggestions, comments, praises and complaints for Chapman Restaurant Services?" 340 students responded to this question.*

Prior to 2013 students could submit questions, comments, concerns, or preferences about any Sodexo service by contacting Sodexo Regional Managers, the Sodexo Student Board of Directors, answering the semester survey, or submitting a comment card. For a few years prior to 2013, a Chapman student started a website called "Noms or Not" that featured pictures and comments about dishes being served in the Randall Dining Commons ("Environmental Operations Informational Meeting", 2016).

After 2013, General Manager Eric Cameron joined the team and following options became available for students to provide feedback:

In Person or via Email: The quickest way to see results was to speak directly with or send an email to Sodexo managers, Eric Cameron, Dustin Finch, or Executive Chef Jim Douglas.
Online: Students may also submit a comment or a food preference request online by going to the Chapman University Restaurant Services website and then clicking *Feedback* under the *People* tab. At the bottom of this page there is a section for suggestions or comments from residents, commuters, faculty/staff, or other ("Getting Involved", 2016).

Student Board of Directors: Every year Resident Dining Operations Manager Dustin Finch organizes a group of students tasked with acting as the liaison between Sodexo and the student body. The various positions on the student board are as follows: Chair of Student Board of Directors, Student Insight Leader, Culinary Innovation Student Leader, Customer Service Student Leader, Health and Wellness Student Leader, Environmental Focus Student Leader,

Media and Marketing Student Leader. ("Student Board of Directors, 2015) Unfortunately, for the academic year of 2015 -2016 there was no student board or directors, This program is chaired through Office Housing and Residence Life (OHRL), and Eric Cameron suspects the lack of student interest or knowledge of the program might have contributed to its absence this year. ("Environmental Operations Informational Meeting", 2016).

Sodexo Semester Student Survey: This survey is administered every semester. However, Eric Cameron notes that fewer and fewer student have been taking it despite the food enticements that persuade student participation. A concerning problem with the survey data is its ambiguity. For example, students may request particular healthier options, but Sodexo managers struggle to define what that means. Something that is healthy to a vegan means something very different to someone who thinks health includes meat. Furthermore, Eric recognizes the difficulty in serving such a diverse group of students. More likely than not, the people taking the survey have radically positive or negative reviews of the food services at Chapman. Therefore, it can be difficult to formulate appropriate changes when Sodexo only collects responses from 20% of the student body, and not the majority. ("Environmental Operations Informational Meeting", 2016)

Operational Hours:

Currently, Randall Dining Commons closes the vegan station on Saturday and Sunday. This operational practice is important to note for this Environmental Audit because vegetarian and vegan diets are the most environmentally sustainable diets. An article in *The Guardian* speaks to the moral and environmental implications of choosing a vegetarian or vegan diet: "One billion people go hungry every day, but livestock now consumes the majority of the world's crops. A Cornell University study in 1997 found that around 13 million hectares of land in the US were used to grow vegetables, rice, fruit, potatoes and beans, but 302 million were used for livestock...our hunger to eat animals has led to overstocking of fragile lands and massive soil erosion and desertification" (Vidal, 2010).

Therefore, from an ethical and environmental perspective, it is important to make these vegetarian options convenient and appetizing for students in order to encourage them to adopt this lifestyle change and reduce Chapman's environmental impact. After the Environmental Operations Information Meeting, it was determined that the vegan station is closed over the weekend because it serves, on average, 200 fewer plates to students than the other meal stations in the Dining Commons, and there is a higher cost associated with the organic produce served. Keeping the vegan station open on the weekends, when there are fewer students eating in Randall Dining Commons, would thus be an impractical choice, especially when coupled with the higher cost of the food at this station. A greater percentage of the student population would need to eat at the vegan station regularly to financially induce the institution

to open it during the weekend hours. In other words, to cover the increased costs associated with the vegan station, more students need to eat there for it to be open on the weekends. According to Eric Cameron, even on the most popular days, the vegans station only serves 150 plates while other stations can serve 400 ("Environmental Operations Informational Meeting", 2016).

To access student enthusiasm in regards to the vegan station and support of a vegetarian/vegan diet, various questions were asked in the 2016 Chapman University Environmental Survey and in the 2016 Earth Week Smoothie Workshop Survey. The 2016 Smoothie Workshop Survey revealed that, based on the 187 responses received, each person eats on average about three meals a week at the vegan station. This might not seem like a lot, but if a student consumes 12 meals a week and decides to eat from each station equally, they will consume, on average, two plates from every station. However, it is important to remember that this average is skewed because a smaller population of students eats from that station very frequently while a large percentage does not eat there at all. However, these result suggested that the vegan station is used just as much as any other station, but by a smaller portion of the population.

To further support this conclusion, see ***Figure 7.5,*** which displays the least used stations in Randall Dining Commons. The popularity of the vegan station matches that of the American Station, and both of these stations trail behind only the Sandwich Station and the European Station. Every station is utilized relatively equally. In fact, when students were asked if they would use the vegan station if it was open on the weekend, 57% said they would use it at least once **(*Figure 7.8*)**.

In ***Figure 7.7***, 63% of student respondents said that, even though they do not consider themselves vegetarian or vegan, they often eat meals that prescribe to that lifestyle. Additionally, in ***Figure 7.6***, only 38% of the population surveyed has never considered switching to a vegan or vegetarian diet, and, of the students who have considered switching, the top two reasons students did not switch were convenience and taste. These results suggest that by opening the vegan station more often and making their options more appealing to student tastes, Sodexo employees can increase the number of students eating vegetarian and vegan plates, thus leading to a more significantly positive environmental impact.

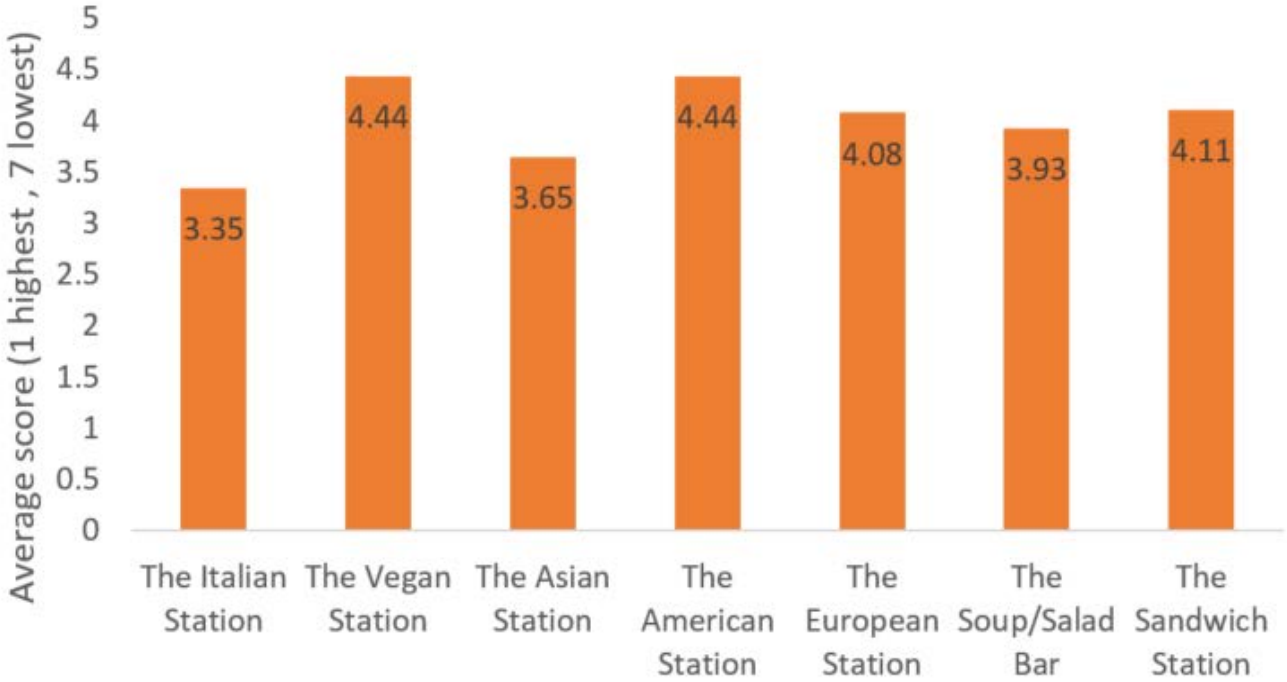

Figure 7.5: *Least Popular Randall Dining Common Stations Results from the 2016 Chapman University Environmental Survey in response to the question: "What station do you visit most often in Randall Dining Commons? Please rank the stations in order with 1 being the station that you visit most often." 302 students responded to this question.*

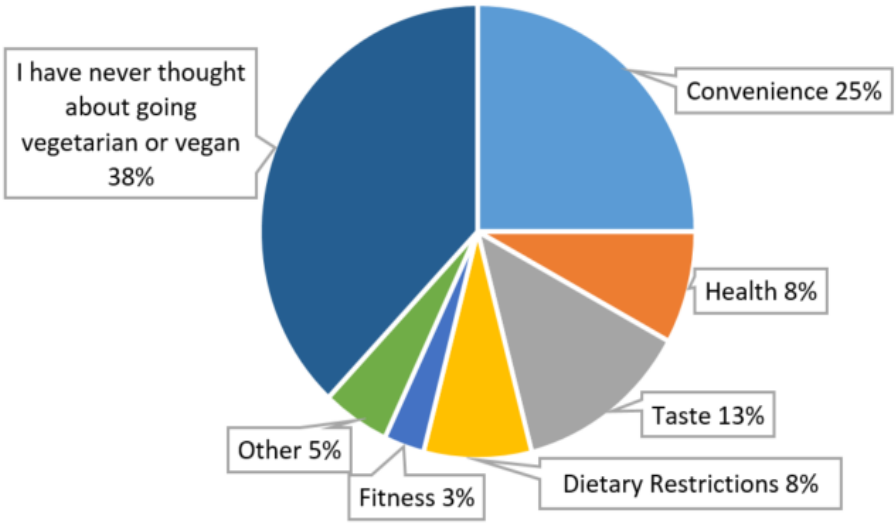

Figure 7.6: *University Environmental Survey in response to the question: "If you have considered eating a vegetarian or vegan diet and chose not to, what stopped you?" 395 students responded to this question.*

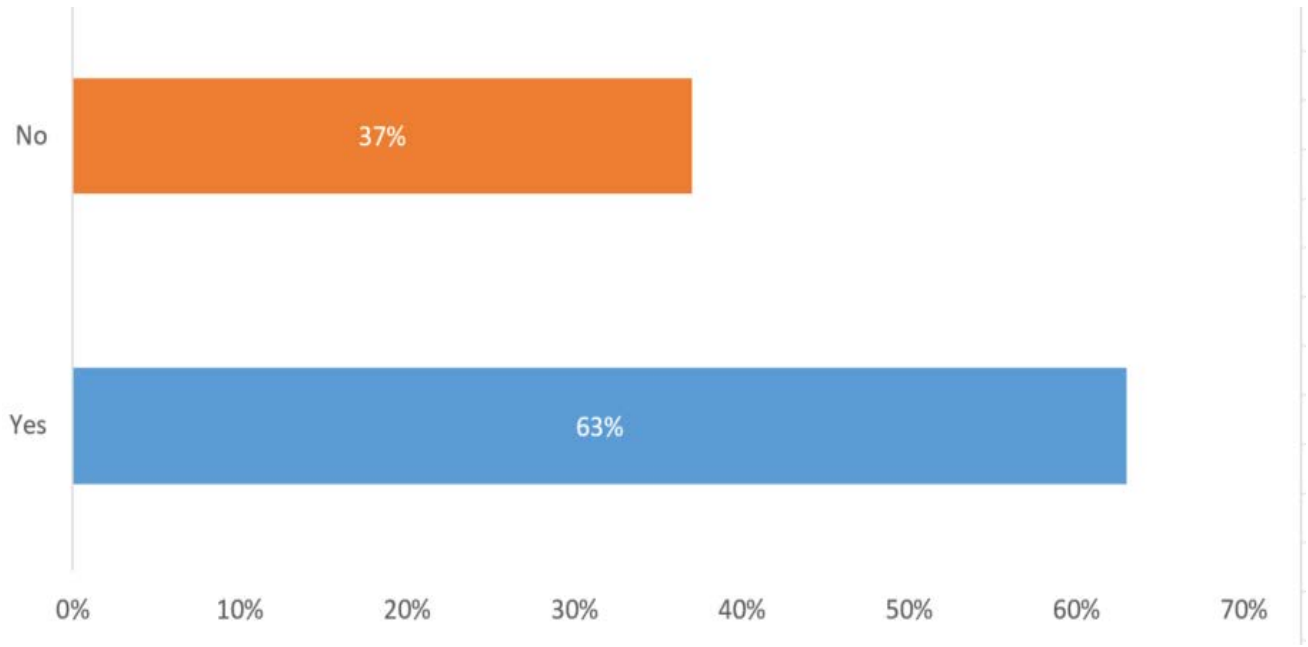

Figure 7.7: *University Environmental Survey in response to the question: "Do you eat vegan/vegetarian food often even though you do not consider yourself a vegan/vegetarian?" 394 students responded to this question.*

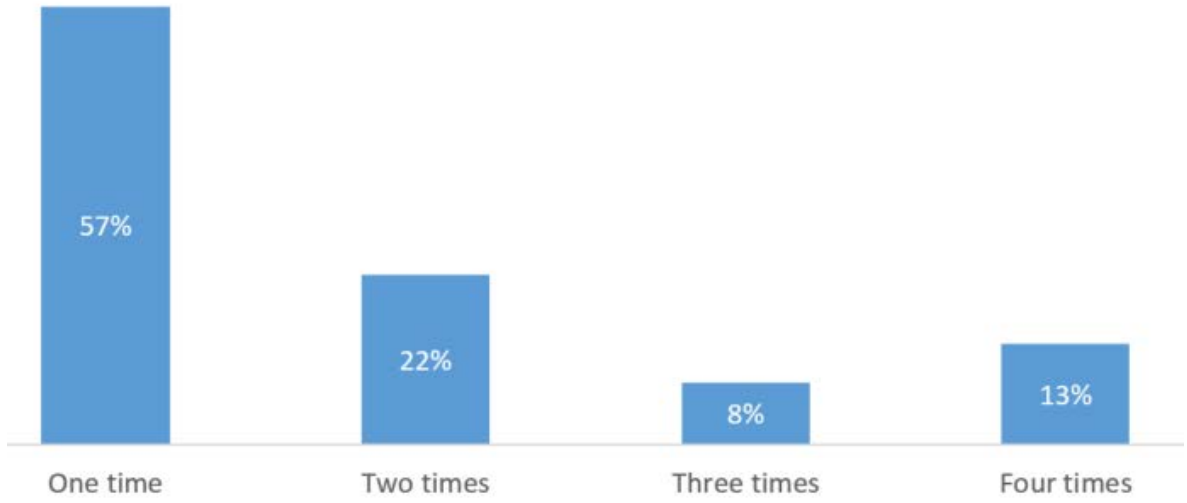

Figure 7.8: *University Environmental Survey in response to the question: "If the vegan station were open on the weekends for both meals on Saturday and Sunday, how often would you eat there?" 277 students responded to this question.*

7.3.2 Post-Consumer Waste

Weigh the Waste

Schools across the country, including many that use Sodexo for their dining services, hold Weigh the Waste events. Although the design of these events varies from campus to

campus, at most events, the total amount of post-consumer food waste from a meal period is weighed, and students are educated on the consequences of waste. Chapman University began its Weigh the Waste program in 2012.

The Weigh the Waste program provides information and opportunities to Chapman students that are vital in order for the University to align with its most esteemed values. The University's mission statement says that Chapman should aid students in leading "inquiring, ethical, and productive lives as global citizens" ("Chapman Facts & History," 2016). In addition, three of the ten principles outlining Chapman's Code of Ethics involve promoting sustainability, serving worthy causes, and respecting university resources ("University Code of Ethics," 2016). Without Weigh the Waste events, the magnitude of university resources lost through food waste go unexplored, students looking to volunteer miss out on a valuable opportunity to serve their fellow students and learn skills, and diners at Randall Dining Commons are unable to start an educated conversation about the sustainability and morality of food waste. One of the best ways to ensure that Chapman stays in alignment with its values on all fronts is to continue to improve the Weigh the Waste program.

Although the Chapman website states that Weigh the Waste events take place on a monthly basis ("Sustainability Initiatives," n.d.), this is not necessarily true. For example, no events were conducted in the fall of 2015. One cause for the lack of events was that there are no members on the Student Board of Directors for this academic year. Members of this board take on a leadership role in Randall Dining Commons and work under Resident Dining Operations Manager Dustin Fitch. These individuals serve as ongoing volunteers for Weigh the Waste events, and one member of the board is designated as the Environmental Focus Student Leader ("Student Board of Directors," 2015).

Mia Babayan, a member of the Student Board for the 2014-2015 academic year, stated that Weigh the Waste events for the 2015-2016 academic year were likely more difficult to hold without the help of the board. According to Ms. Babayan, it was difficult to recruit new members for Fall 2015, and they were not even able to elect a Chair for the Student Board. From her point of view, although being a member of the Student Board was not a large time commitment and came with the added benefit of free meals from Randall Dining Commons, the recruitment process could have been improved through better publicity of the positions and their benefits.

Reducing food waste is not only significant for environmental and social purposes but also for financial purposes. Approximately 40% of food produced in the U.S. goes uneaten, and this costs the U.S. over $165 billion annually (Plumer, 2012). With Chapman's plan to increase the student body to eleven thousand students by 2020, the cost of food waste adds up quickly. It is therefore crucial to monitor the amount of food wasted over time in order to make financial recommendations and to determine ways to cut costs.

Weigh the Waste Events of 2016

Three Weigh the Waste events were hosted in the spring of 2016 with the assistance of Dustin Fitch and the Randall Dining Commons staff, members of Mackenzie Crigger's Environmental Science and Policy Capstone course, and additional student volunteers. On March 10th, 297.0 lbs. of food waste accumulated during one two-and-a-half-hour lunch period. The amounts of waste for the events on April 4th and 14th over the same amount of time were 293.2 lbs. and 229.2 lbs., respectively (***Figure 7.9***). This is equivalent to 0.32 lbs./student on March 10th, 0.29 lbs./student on April 4th, and 0.25 lbs./student on April 14th. The five categories of waste assessed included meat waste, edible waste, inedible food waste (IFW), liquid waste, and miscellaneous waste (napkins, paper cups, etc.). ***Figure 7.10*** shows the breakdown of waste by percentage for the event that took place on March 10th. The breakdown by percentage is similar for both events held in April 2016. This collection of data is unique in that meat has never been assessed in its own category of waste before.

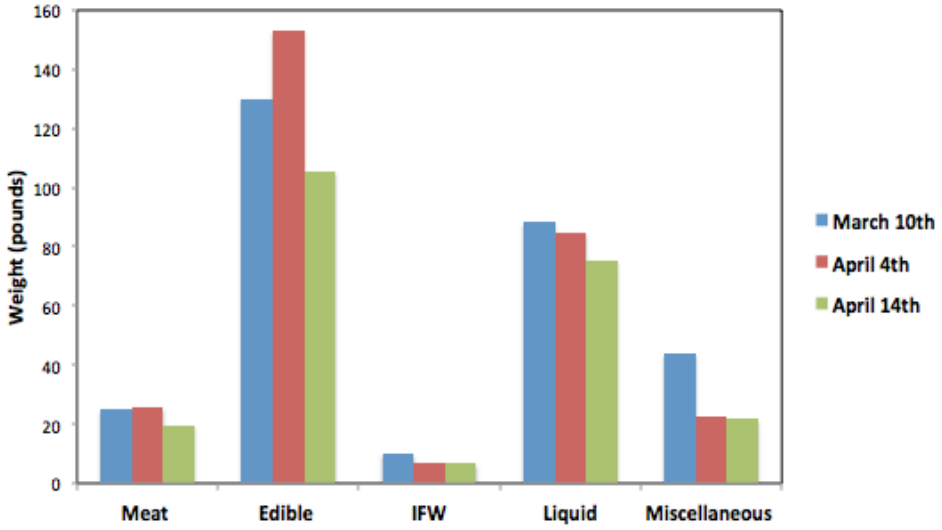

Figure 7.9. *Weigh the Waste data from events held on March 10th, April 4th, and April 14th.*

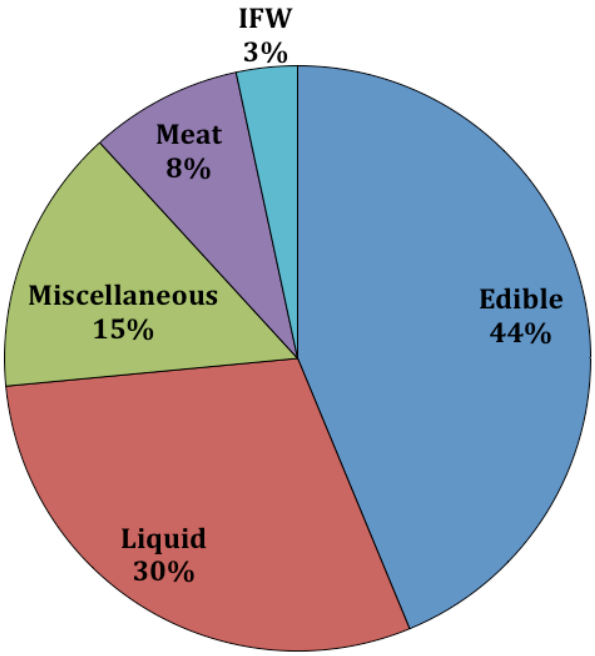

Figure 7.10. *The breakdown of waste by type from the Weigh the Waste event on March 10th, 2016. Note that "IFW" refers to inedible food waste such as banana peels, apple cores, etc.*

Each successive event held in Spring 2016 saw a decrease in both overall waste and waste per student. This is likely an indication of increased awareness surrounding the program and its goals. If this is the case, then holding multiple events each semester will help to reduce waste over time and create a culture of heightened respect for Chapman's resources.

It is also important to note that these three events were conducted in different ways. No attempts were made to alter the current Weigh the Waste program for the event on Thursday, March 10th, 2016. The event that took place on Monday, April 4th was unique in that it took place on a voluntary Meatless Monday. Finally, a variety of educational tools were utilized on Thursday, April 14th for students to gain a better understanding of the environmental and social costs of waste.

These educational tools included:

- A poster about the environmental costs of food waste (***Figure 7.20*** located in the appendices)
- A poster regarding the amount of food wasted worldwide and in the U.S., as well as the financial costs of that food waste (***Figure 7.21*** located in the appendices)
- A poster about the carbon costs of a meat-based diet (***Figure 7.22*** located in the appendices)
- A poster stating how many people could be fed by the waste produced in Randall Dining Commons during the event on March 10th, 2016 (***Figure 7.23*** located in the appendices)

- A poster supplying a list of easy ways to reduce food waste (***Figure 7.24*** located in the appendices)
- A "Guess the Waste" activity administered at dinner the following evening for students to use critical thinking skills to guess how many pounds of waste were accumulated (the waste from lunch was left out for them to see)
- A comment board for students to state their opinions on food waste
- A volunteer holding a sign that read, "Questions? Ask me!", who answered students' questions

Ninety students participated in the "Guess the Waste" activity. The guesses ranged from 42 lbs. to 1,717 lbs., indicating that there is a lack of awareness among the student body regarding the quantity of food waste. The comments individuals left outlined social concerns, environmental concerns, overall disappointment in the wastefulness, and gratitude towards the volunteers for highlighting such an important issue (7.8.2. located in the appendices). As students exited the cafeteria, they were asked to take a survey about which method of food waste education was most beneficial for them. Fifty-three students filled out this survey, and all methods were selected as beneficial by at least seven individuals. Based on the survey results, the most popular methods of waste education were the poster addressing waste from Randall Dining commons, the poster regarding the amount of food wasted worldwide and in the U.S., and the poster with tips for reducing waste.

The University of California Irvine (UCI) has a proficient Weigh the Waste program, and Tyson Monagle, UCI's Sustainability Coordinator, provided information about that program and offered suggestions to make Chapman's program more successful. As Tyson expressed, the most effective way to cultivate an empathetic student body is to avoid inflicting guilt upon students for producing waste and instead to focus on the importance of reducing waste and the simple behavior changes that can decrease it. At UCI, the Weigh the Waste program includes a "Guess the Waste" activity, which inspired the activity used at Chapman on April 14th, 2016 (Tyson, 2016).

Past Weigh the Waste Events

Unfortunately, Weigh the Waste results from many events that took place between 2012 and 2015 could not be recovered. However, the data that was kept provides an interesting longitudinal study describing changes in the waste stream as well as changes in data collection practices over time **(*Figure 7.11*)**.

Figure 7.11 highlights the extreme lack of data for Weigh the Waste events. In addition, it appears that the waste stream rose from 2013 to 2014 and has started falling back down again in 2016. However, there are a number of reasons why this trend may not be accurate. The duration of the event, the amount of food collected that is actually weighed, the number of

students eating in the Randall Dining Commons, and the method for taking attendance may all vary from one event to the next.

For example, manually operated attendance trackers (operated by simply pressing a button each time a person leaves waste) were used for several events while attendance records provided by the cafeteria cashiers have been used for others. Both were utilized during the event on March 10th, 2016, and it was found that the cashier record, which is assumed to be more accurate, counted approximately 200 more students than the manual record. Because of this, it can be assumed that the amounts of waste per student values, found by dividing total waste by the total number of students, were actually lower than recorded for some events taking place prior to 2016. At several events, the waste-per-student data was not recorded at all. In addition, although the dates for the 2016 Weigh the Waste events had been set in advance, for two out of the three events, members of the Randall Dining Commons staff were unaware that an event was taking place. This lack of communication may have caused past events to start at different times or run without access to the proper equipment during the event.

An article published by Mackenzie Crigger in 2013 stated that, since the program started in 2012, waste had dropped from 4.6 lbs. per student per lunch period to 3.2 lbs. per student per lunch period (Crigger, 2013). If this is true, then the drop to approximately 0.29 lbs. in 2016 is an incredible accomplishment in terms of Chapman's waste reduction. Given the fact that many factors vary from one Weigh the Waste event to the next, it is likely that the change has not been this extreme. However, Crigger has stated that, since the program began, Sodexo employees have made significant changes to reduce food waste. Specifically, portion sizes and plate sizes were reduced between 2012 and 2016. Regardless, there is much room for improvement. In 2009, three years before Chapman's Weigh the Waste program even began, University of California, Davis published a dining waste audit in which they found that waste averaged 0.23 lbs. per student (Lee, 2009). In spring 2015, waste had dropped to a mere 0.1 lbs. per student ("Waste Reduction…" 2016).

Several of Chapman's benchmark institutions, including Claremont McKenna College and Gonzaga University, also host Weigh the Waste events and have employed several other methods of post-consumer waste reduction. At Gonzaga, Sodexo employees partner with Gonzaga's Environmental Organization to hold Weigh the Waste events, and, like Randall Dining Commons, dining locations also feature Xpress Napkin holders that reduce napkin waste (Theisen, 2008). With the help of students, Claremont McKenna's dining services team weighs leftover food waste after each meal period and does not shy away from making commitments to reduce waste; back in 2010, they publicly set a goal to reduce food waste by 25% by 2013 ("Claremont…" 2010).

As the 2016 Chapman University Environmental Survey results indicate, less than 50% of the 356 students surveyed find that the Weigh the Waste events are even somewhat impactful.

In addition, 29% of students surveyed, who all dine in Randall Dining Commons, are not familiar with Weigh the Waste events. There is a lot to be done to strengthen student perception and awareness of food waste. Furthermore, almost one-third of students dining in Randall Dining Commons are unaware that Weigh the Waste events are held. The large majority of students completed the survey before the educational Weigh the Waste event was held on April 14th, 2016. Therefore, it is likely that the percentages of students who know what Weigh the Waste events are and find them impactful will increase as more events are held and more educational tools are utilized.

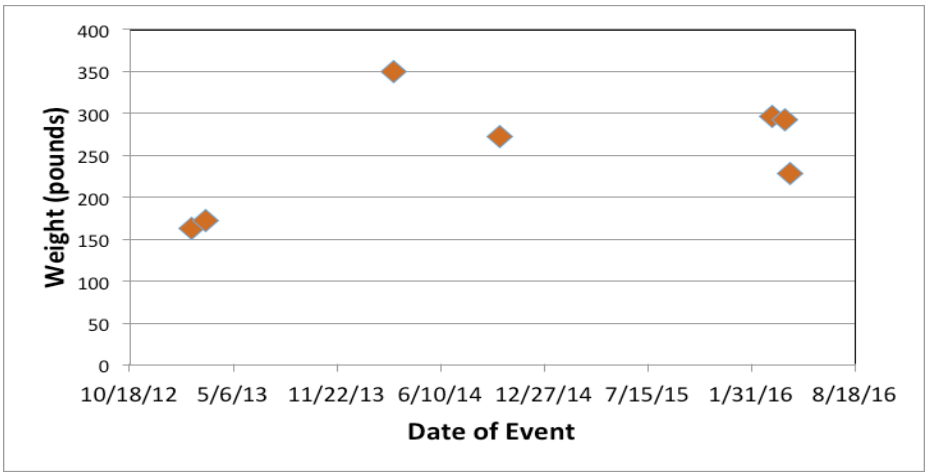

Figure 7.11. *The only accessible Weigh the Waste results from events conducted from 2012-2016. Total weight of waste from all types of waste combined is shown.*

Figure 7.12. *Photographs taken during the Weigh the Waste events of spring 2016.*

Meatless Mondays

Currently the Meatless Monday program, while it may encourage students to curb their meat consumption, has no system in place to assess the actual impact it has made. Assuming that meat waste strongly correlates with meat consumed, the results from the Weigh the

Waste event on Monday, April 4th, 2013 indicate that meat consumption is likely no lower on Mondays than any other day. Meat waste totaled 25 lbs. on March 10th, 25.75 lbs. on April 4th, and 19.75 lbs. on April 14th. On Monday April 4th, meat consumption per student was a mere 0.002 lbs. lower than it had been on Thursday, March 10th, but it was also 0.004 lbs. higher on than it was on Thursday, April 14th. Based on this data, it appears as if Meatless Monday's impact was essentially nonexistent. In order to change this, additional informational posters, demonstrations, and program promotions within new student orientation are necessary. The most effective strategy for strengthening the program would be to not serve meat for one meal period every Monday, and it is recommended that Chapman work towards this goal in the future. Of course, this was only one semester. Meat was not weighed separately from other edible waste until 2016, so repeated events in which meat is assessed independently are required for a definitive answer as to the effectiveness of Meatless Mondays.

The 2016 Chapman University Environmental Survey results indicate that approximately 59% of students who currently eat at the dining commons are in support of the implementation of Meatless Mondays, in which Randall Dining Commons would serve no meat for one lunch period once a week in order to reduce fossil fuel consumption **(*Figure 7.13*)**. In addition, 59% of survey respondents would like to be provided with more information about the environmental costs of food waste. Therefore, there is strong student support behind strengthening the Meatless Monday program so that more informational posters are included and no meat is served at all during lunch.

Several of Chapman's aspirational schools also boast Meatless Monday programs. Just this spring, University of Redlands held two Meatless Mondays in which vegetarian dinners and cooking demonstrations were provided for all who attended ("Meatless Monday in the University Club," 2016). At Tufts University, "Eco-reps" hold Meatless Mondays throughout the year in which they ask students to eat meatless meals and obtain signature pledges from those who accomplish the goal ("Campus Sustainability…" 2015).

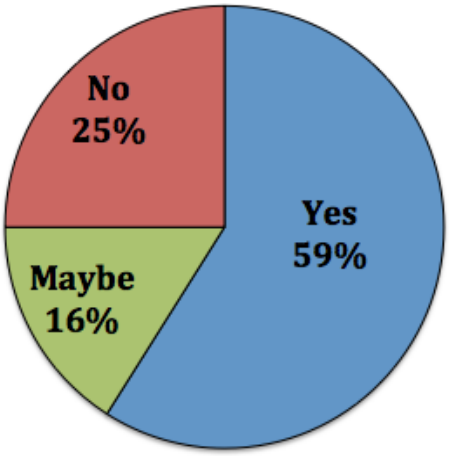

Figure 7.13. *Results from the 2016 Chapman University Environmental Survey in response to the question: "Would you be in support of the implementation of Meatless Mondays, in which Randall Dining Commons would serve no meat for one lunch period once a week in order to reduce fossil fuel consumption?" 335 students responded to this question*.

The Just Ask Initiative

According to the 2016 Chapman University Environmental Survey, approximately 46% of students who currently eat in Randall Dining Commons never utilize the Just Ask Initiative (***Figure 7.14***). Given the fact that Randall feeds hundreds of students every meal period, not every student will find pre-plated meals that meet their exact preferences. It is safe to assume that every student would like to change something about most of the meals they consume, but the 2016 Environmental Audit survey results indicate that they are not seizing the opportunity to do so. Given that only 13% of survey respondents stated that they always use the program, a vast majority of students miss out on this opportunity to both satisfy their preferences and potentially reduce food waste.

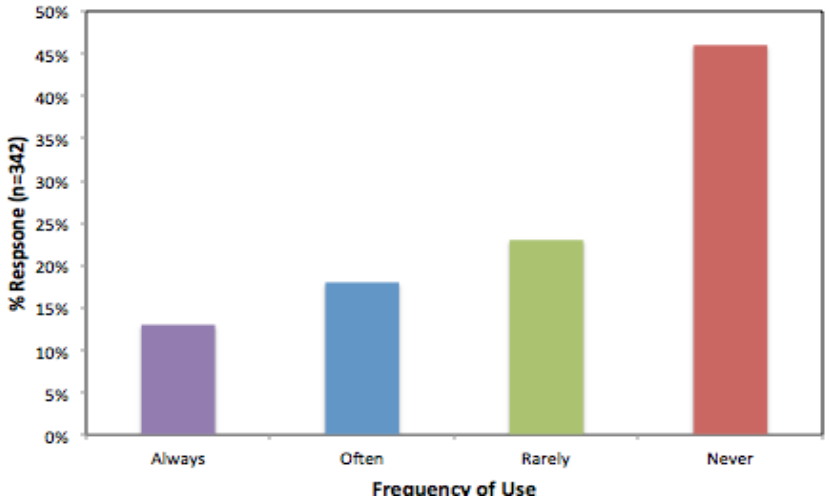

Figure 7.14. *Results from the 2016 Chapman University Environmental Survey in response to the question "How often do you take advantage of the Just Ask Initiative, which allows you to customize your meal by cutting down portion sizes, switching to whole wheat options, adding vegetables, removing sauces, etc.?" 342 students responded to this question.*

Pre-Consumer Kitchen Waste

Wasting food not only contributes to dangerous greenhouse gas emissions via the energy required to produce, transport, and cook it, it also increases the methane released from landfills ("Policies and Practices", 2015). Instead of wasting perfectly good food that will ultimately end up in landfills, organizations may donate food to people in need. Feeding America estimates that only five billion lbs. of food would be needed to end hunger in the United States (Dookan, 2012). About 22 billion lbs. of edible food is wasted annually in the foodservice industry alone. The March 10th, 2016 Weigh the Waste event at Chapman found that the majority of food waste was edible (44%). Although The Lean Path has significantly reduced the amount of overall food waste, food that is not used during preparation or capable of being used at another time is thrown away. Moreover, food that is spoiled, hard to conserve or otherwise inedible is disposed of.

Certain guidelines and protocols force some food items to be discarded after being opened, mixed with other food items, or for other health code reasons. This includes products such as meat, dairy, and cheese. However, there are certainly ways to be more responsible about discarding unused food items. This wastefulness is a trend visible in the 2013 Environmental Audit, which noted that "sustainability in dining services at Chapman has progressed somewhat slowly over the past ten years"("2013 Campus Sustainability Audit," 2013). Chapman has since made strides to minimize the waste stemming from unused raw products by sharing such items with on-campus eateries such as Einstein's, Sub Connection and Qdoba.

Sodexo team members answered questions regarding how edible food is handled and what measures could be taken to repurpose unused food items. Their responses are listed below:

- Q. What qualitative information do you base your food orders on?
    A. "Based on historical usage for each item in the menu cycle."
- Q. According to your data, how much of each food group does a student eat per day?
    A. "We do not track or have a way to track per student information."
- Q. How is food that is never consumed or served treated?
    A. "Scratch production and our *a la minute* cooking procedure essentially minimize this to zero. Our chefs cook in small batches, 4 to 5 servings at a time. Raw ingredients are prepared and only used when we actually cook and combine them. An example would be peppers prepared for pasta at lunch. If we do not use all the prepared peppers, we can also use them in the stir fry at the wok for dinner."
- Q. How much of this food is discarded? How much is preserved?
    A. "Very little, only food prepared for service to the public is discarded if not consumed."
- Q. What policies are in place that prevent unused food items from being repurposed or donated?
    A. "We do not reuse food cooked and plated for our customers. Only on occasions after a large event will there be enough product leftover for donation. We adhere to all health department requirements that govern our license to serve food."
- Q. Are any food items frozen or preserved if unused?
    A. "No"
- Q. What technology or policies have been used to minimize pre and post-consumer waste?
    A. "We have worked with Lean Path to measure pre consumer prep waste."

The answers provided by the Sodexo managers, specifically Dustin Fitch and Eric Cameron, would lead one to assume that pre-consumer/prep waste is very minimal. The scratch production strategy and *A La Minute* cooking procedure require food preparers to only cook food when there is demand. Leftover uncooked food is to be used for proceeding meals throughout the day. Finch also stated that all of the produce left-overs were used in a later meal or transported to one of the on-campus eateries (ex. Einstein Bagels, Qdoba, Sub Connection). Additionally, should any food be left over from serving, the kitchen staff would eat it after the meal period.

Catering

Sodexo also has a catering service called "Flavours" which provides prepared food for various on-campus events such as sorority and fraternity dinners, banquets, conferences and university sanctioned activities. The catering process is much different from the Randall Dining Commons food prep process. All of the food is ordered by quantity and is not prepared by way

of *A La Minute*, thus leaving room for much waste and unconsumed food. This food has to be discarded because it is already prepared and served. However, the leftover food is typically still adequate for human consumption. There is no donation process in terms of the leftovers from catered events. A chapter of The Food Recovery network would be extremely beneficial and useful in this regard. This food could be donated to local homeless shelters and food kitchens.

An audit was held at Randall Dining Commons on April 19th, 2016 to measure the actual pre-consumer waste generated onsite. Although access to the prep kitchen was not granted, multiple food prep workers were interviewed on-site about the food waste for which their respective station was responsible. Two workers claimed that "a lot of food goes to waste...a lot of sushi, a lot of pizza and pretty much most of the stuff leftover from cooking." Another kitchen staff worker from a different station claimed that while some things are saved and donated, some things just "need to be thrown away." After a lunch meal period and a dinner meal period, the leftover plates were accounted for from each station.

	Pizza/Pasta	Vegan	Sushi/Asian	American	European
Lunch	3 whole pizzas, 5 plates of pasta	10 servings of fresh vegetables, 5 plates of food	3 whole rolls uncut, 8 plates of cut rolls	1 full tray of grilled cheese	3 plates of chicken, 3 plates of potatoes
Dinner	2.75 pizzas, 3 plates of tater tots and omelets	6 plates of food, whole gallon bowl of brown rice, large bowl of vegetables	5 whole rolls, 7 plates of cut rolls	¾ tray of tater tots, 5 plates	5 plates of food, whole gallon bowl of vegetables

Figure 7.15. *Leftover plates from each station from the audit conducted on April 19th, 2016.*

In addition to the five core stations, the sandwich and salad station apparently cycles produce through in such a way that generates zero waste or leftovers. However, there were plenty of dessert and fruit leftovers. Some of the fruit looked very ripe and as if it would be close to the point of disposal. I am not convinced that such fruit would be served again the following day because students would not consciously select overly-ripened fruit. It can be assumed that this fruit gets discarded.

Figure 7.16: *A bowl of grilled cheese sandwiches (covered by plates) to be disposed of.*

Figure 7.17: *Leftover sushi that is headed to the garbage.*

Figure 7.18: *Eight plates of leftover lasagna*

It was found that only a small portion of edible pre-consumer food waste was generated in comparison to the total amount prepared at Randall Dining Commons. This waste is due to some food items being tainted or served, but not consumed. Kitchen staff workers explained that while there was some waste, most of that waste is only the leftover ingredients from the meal period, which was usually a fraction of the amount of food items ordered. However, some food items such as the fruit, desserts, breads and cereals could be treated differently to avoid compost. These items along with the served, but untouched plates could be donated to those in need through various food kitchens (such as Mary's Kitchen in Orange). If Chapman had a Food Recovery Network chapter, they could facilitate the transfer of food items to such destinations.

7.4 Concluding Assessment

7.4.1 Areas Where Chapman is Doing Well

In terms of post-consumer waste, Chapman provides a number of programs aimed at reducing waste and educating students about the consequences of waste. The Just Ask

Initiative reduces waste by allowing students to shape meals to their preferences, vegan and vegetarian options reduce the consumption of products that require a great amount of resources to produce, and the Weigh the Waste and Meatless Monday programs educate students about the impacts of their food choices and waste accumulation.

In terms of pre-consumer kitchen waste, there is "minimal waste" created from kitchen prep due to *A La Minute* cooking process. However, some waste is inevitable and cannot be cycled into the normal process of food rotations to conserve food items. Chapman has also adapted the strategy of transferring some food items to other on-campus eateries whenever a leftover food item is in demand at another location on campus. For example, if there is leftover chicken from lunch in Randall, it can be taken to Qdoba to use in their quesadillas. This helps the University work towards achieving "zero waste" status. Although it is not a regular occurrence, Sodexo management has made efforts to donate food to appropriate food kitchens after large events such as Spring Sizzle and Homecoming. Such donation practices can be improved by adopting a chapter of the Food Recovery Network as explained in section 7.5.2.

In terms of operational procedures, Sodexo has done an excellent job providing a multitude of avenues for student to submit food preferences. For full details see section 7.3. Additionally, Executive Chef Jim Douglas stated that he is very willing to incorporate new student recipes into the food rotation if requested. In fact, all the Sodexo General Managers expressed great concern for sustainability and reducing pre- and post-consumer waste by aligning student desires with the purchasing orders of Randal Dining Commons ("Environmental Operations Informational Meeting", 2016).

7.4.2 Areas in which to Improve

Operational Procedures

Lean Path: It is clear that without purchasing 5 additional Lean Path tracking subscriptions and machines for each station, costing $2,995 for the first month, it would be operationally impossible to implement Lean Path Tracking throughout all stations in Randall ("Pricing | Lean Path," 2016). It would be too operationally disruptive to expect employees to weigh their pre-consumer kitchen waste after each preparation period and after each meal with only one weighing station. However, if only one station was to utilize this system for a month the results from that month could then be used to determine if purchasing additional units would be best to help reduce waste in Randall.

Student Preferences: As stated previously in the section **7.4.1**, Sodexo has done an excellent job at providing a variety of avenues for students to submit their preferences yet only 56% of students know now to utilize these resources (***Figure 7.4***)**.** Therefore, it is imperative that a campus-wide marketing campaign be implemented to inform students of these options. This project can be undertaken by the Student Board of Directors or Sodexo Executive Managers.

Also, according to the 2016 Earth Week Smoothie Survey results, students might benefit from a few new avenues for submitting food preferences. ***Figure 7.19***, located in the appendices, indicates that the easiest way for students submit their preferences is through in person interactions and Facebook. Initiating bimonthly focus groups with the Student Board of Directors for students to submit concerns in person and Facebook page, similar to the Norm or Not website, that gives student the opportunity to easily share their food recommendations with Sodexo's executive management team.

Post-Consumer Waste

One weakness that is shared by the post-consumer waste programs is that there is not a sufficient system in place to analyze the effectiveness of the programs or the changes in the waste stream over time. The fact that Chapman's Weigh the Waste events are not held on a consistent basis, are not run by a consistent set of students, staff, or faculty members, and do not measure food waste with a consistent method put Chapman at a disadvantage compared to other schools. The faculty support, student interest, and equipment needed to improve this program are readily available, but a lack of systematic communication prevents the program from remaining efficient. There are no programs in place to monitor the effectiveness of Meatless Mondays or the Just Ask Initiative. However, if the meat separation methods employed in the Weigh the Waste events of spring 2016 become a permanent element of the program, then the effectiveness of Meatless Mondays can be monitored over time.

Another weakness involves the education and promotion of these programs. On the Chapman University website, one can locate a 2014 weekly announcement from Dean Price that calls for volunteers to conduct a Weigh the Waste event (Price, 2014). However, this is the only weekly announcement from Price that calls for volunteers and one of only two weekly announcements that mentions Weigh the Waste. Given that Weigh the Waste events are not consistently mentioned in these weekly announcements that reach every student, it is clear that the promotion of the events is not consistent, and thus the stream of volunteers for the events is also not consistent. To promote the event held on April 14th, 2016, the Weigh the Waste event was announced in Dean Price's email as well as in an email sent out by Dr. Jason Keller to all students in the Environmental Science and Policy Major. Through this method and through promotion of the event in other Chapman clubs and organizations, approximately fifteen student volunteers were recruited to work for each event in 2016. However, these methods of outreach are not employed during a typical academic year, and Weigh the Waste events are not held at consistent times that students can anticipate. While there is a link on the Chapman Dining Services page for students to express their interest in volunteering to the Student Board of Directors, the link leads to a page that no longer exists ("Sustainability Initiatives…" n.d.)

On the Monday of Earth Week in 2014, Chapman's Meatless Monday campaign was expanded so that, rather than simply encouraging students not to eat meat, there was no meat served in the Randall Dining Commons for one two-hour lunch period. In response, there was a public uproar from a small group of students who vocalized their concerns, saying that it was unjust for Chapman to deny students the choice to eat meat. This outcry is evidence that either not all of the student body was on board with the Meatless Monday program or that there was a lack of education surrounding the event and/or the Meatless Monday campaign overall. According to Eric Cameron, there was miscommunication between the Sodexo staff and students advertising the event outside of the cafeteria. Several students also reported that they were not aware that the Meatless Monday event was taking place. These communication issues likely played a significant role in the event's downfall.

There is also a weakness in terms of how the information from the Weigh the Waste program is displayed for the public. There is no publicly accessible database, nor any database for that matter, that students, faculty, or members of the community have access to in regards to Weigh the Waste results. Chapman's website features three images showing results from past Weigh the Waste event(s). The first shows that, over one lunch period, 134 lbs. of waste were accumulated and that this amount of food "could feed the average American family for eleven days." The next two Weigh the Waste results images equate this same amount of food using different parameters, but, because all three results use 134 lbs., it is unclear whether these results are from multiple events or just one ("Sustainability Initiatives," n.d.). One concluding recommendation from the 2013 Environmental Audit was that action be taken to increase student awareness, appreciation, and action towards waste solutions ("2013 Campus Sustainability Audit…" 2013), but methods to do so have not been thoroughly investigated.

Pre-Consumer Waste

In regards to pre-consumer kitchen waste, Chapman can improve by observing other schools. Anne Krieghoff, University of California, Irvine's Sustainability Manager, explained the programs currently in action on their campus and described how they have efficiently reduced organic waste. Their program includes some of the methods mentioned above and has led them to achieve an 83% waste diversion rate (Krieghoff, 2016). They are also on track to achieve zero waste by 2020. By acquiring some methods used by universities such as UCI, Chapman can also minimize pre and post-consumer waste.

The Food Recovery Network spreads awareness among college students about the amount of perfectly edible food that is wasted and works to divert that food to people in need. It was established in 2011 by three students from the University of Maryland and has grown to 150 chapters all over the country ("Our Model," 2015). The program is volunteer-based and has been extremely successful in diverting edible food waste. Interestingly enough, the Sodexo Foundation donated $150,000 to The Food Recovery Network, which allowed the volunteer-

based program to hire full-time staff and expand to more campuses ("Our Model," 2015). According to Sustainable America, students attending any college in the country have the ability to create a chapter of FRN at their respective school. Claremont McKenna College, Occidental College, University of Southern California and University of San Francisco all have chapters of the Food Recovery Network ("Our Model," 2015). All five are aspirational schools for Chapman. Incorporating this practice on Chapman's campus would allow for an easier and more specific way to facilitate food donations by allowing kitchen staff to directly contact a group that is solely responsible for donating food waste. This waste includes food from Randall Dining Commons, Qdoba, Sub Connection, Flavours Catering and other on-campus eateries.

Much like the Food Recovery Network, the Campus Kitchen Project (CKP) helps divert edible food that would be wasted to members of a campus' community, local supermarkets, restaurants, and farms. They also have volunteers who prepare meals for people in need using the donated food. CKP serves over 14,000 people in need per month and has 45 chapters nationwide. Sodexo is a major contributor to the Campus Kitchen Product, serving as one of their main financial supporters. These chapters have collectively recovered 868,007 lbs. of food ("The Campus Kitchen Project," 2016). Much like The Food Recovery Network, CKP also allows campuses all over the country to start chapters.

7.4.3 Existing gaps in knowledge

The results of many Weigh the Waste events conducted between 2012 and 2015 are still unknown, as is the number of events that have been conducted in that time period. Another area of research lies in determining the accuracy of how much waste per student per lunch period has changed over the course of time. Because a difference in attendance-taking methods may have resulted in inaccurate waste per student calculations, attendance records from Randall Dining Commons cashiers are needed to resolve the question of accuracy. It is unknown how difficult it will be to access this information.

In addition, although the meat consumption on the Meatless Monday of April 4th, 2016 was not significantly different than the meat consumption on other weekdays in 2016, many additional Weigh the Waste events, in which meat is measured separately, are needed in order to establish confidence in this finding.

Little is known regarding how or if Sodexo honors the demand for each food group and if over-ordering certain food items is a significant factor in the generation of edible food waste. According to Dustin Fitch, the food orders are made based on the history of demand, however the demand must change with the growing student population. Thus, it must be constantly changing. There is also a gap in knowledge for why food donation policies have not been instilled, as introducing such programs could allow Chapman to achieve true "zero waste" status.

7.5 Recommendations

7.5.1 Easy

Quick ways to improve sustainability in Randall Dining Commons:

- Include a bucket for measuring meat waste on its own when conducting future Weigh the Waste events.
- Conduct every third Weigh the Waste event on a Monday to compare the meat consumption on Meatless Mondays to meat consumption on other days of the week.
- Provide the following educational tools during Weigh the Waste events: information about the magnitude of food waste in the U.S. and worldwide, information about how many people could be fed with food wasted at Randall Dining Commons (use most recent Weigh the Waste data), and information about ways to reduce food waste. Students rated these methods of raising awareness as the most powerful methods.
- Create a Weigh the Waste results database to be displayed on the Chapman Dining Services website.
- Obtain a new scale that is used solely to measure food waste during Weigh the Waste events to ensure accuracy and consistency among events and to ensure that a scale is always readily available
- Publicize the Just Ask Initiative to a greater extent by providing promotional posters at every cafeteria station, discussing the program during freshman orientation, and sending reminders out in Dean Price's weekly emails. This promotion will benefit Chapman Dining Services as well as students by allowing students to recognize the flexibility in their meal choices.
- Continually assess student opinions on the effectiveness of the Weigh the Waste and Meatless Monday programs through informal surveys given in Randall Dining Commons as well as through future Environmental Audit surveys. The relevant questions asked in this audit survey should be replicated as closely as possible to determine how student opinions change over time.
- Oversee and enforce food handling policies to reduce edible food waste.
- Increase the accuracy of Just Ask Initiative and reflect results in food ordering by starting or joining a chapter of the Food Recovery Network or the Campus Kitchens Project.

7.5.2 Moderate

- Ensure that all Weigh the Waste events are promoted in one of Dean Price's weekly emails sent out to students with a link to sign up to volunteer for the events. To give students ample time to volunteer, the events should be publicized at least one week before their occurrence.
- Normalize the procedures (including attendance, event duration, education methods, waste measurements, etc.) carried out during Weigh the Waste events. This may be done through the creation of a Weigh the Waste guidelines document distributed to each Sodexo staff member as well as each individual volunteering at the event.
- Promote the applications for the Student Board of Directors by sending out emails to all students during application seasons. These emails should be dedicated solely to the Student Board of Directors, focusing on the leadership opportunities and the benefits

the program supplies. In addition, recruitment practices should include promotion of the position during new student orientation as well as informational posters displayed in the cafeteria.

- Use the results of subsequent Weigh the Waste events to create educational posters in Randall Dining Commons so that the progress on waste elimination is as up-to-date as possible. This will ensure that students stay informed.
- Increase the number of vegan and vegetarian options served in Randall Dining Commons to better reflect student preferences.
- Become a partner of the Food Recovery Network to help with pre-consumer kitchen waste.
- Adopt diversion strategies for edible food waste including waste-to-energy technology, food donation, and composting.
- Start a chapter of the Food Recovery Network and/or the Campus Kitchen Project. A student-ran, volunteer-based chapter would allow Sodexo workers to have a contact point to facilitate donating any amount of edible food to local food kitchens. Once an event or dining period has ended, kitchen staff can contact the appropriate member of the FRN chapter to collect and transfer the food for donation.
- Hire a student employee to start gathering and synthesizing more data regarding student preferences and pre-consumer kitchen waste.
- Donate food to local homeless shelters.

7.5.3 Challenging

Costly yet important ways to improve sustainability in Randall Dining Commons:

- Strengthen the effectiveness of the Meatless Monday program by ensuring that no meat is served in Randall Dining Commons during lunch on Mondays. This may take extensive efforts in planning for the Sodexo staff to change what foods they order each week. However, there was no meat served during lunch on the Monday of Earth Week in 2014, indicating that Sodexo is capable of altering food purchases to this end.
- Hire staff members that are solely responsible for overseeing sustainability initiatives in Randall Dining Commons. According to Anne Krieghoff, UCI's Facilities Management Sustainability Manager, UCI elects certain staff members to take on these roles, and these staff members are called Green Captains (Krieghoff, 2016).
- Utilize Chapman courses to improve Weigh the Waste events by making the program part of the curricula. Courses with an environmental or service theme could require students to volunteer for a Weigh the Waste event or provide them with extra credit for volunteering. This would aid student learning as well as serve as a great leadership opportunity.
- Remodel Randall Dining Commons to make it easier for employees to utilize the Lean Path measuring system or buy more weighing stations and increase training for Sodexo employees on how to record this information.
- Build a tracking system that counts the number of students taking plates from each station. This information can then be analyzed by meal type and eating period to discern

which plates are most popular at certain times during the day and more informed purchasing decisions can take place.

7.5.4 Future areas of research

A more thorough investigation into the results of past Weigh the Waste events, including the actual amounts of waste as well as the number of students that attended each lunch period, would provide valuable information. Without this information, it is very difficult to get an accurate picture of how the waste stream has fluctuated. Continued evaluations of students' preferences for Weigh the Waste education will also give a better indication of which aspects each class of students finds most engaging.

Although it is clear that there is no Student Board of Directors for 2015-2016, it is unknown whether or not the Sodexo staff has decided on a course of action to address the lack of participation. Future research might include determining which staff members have roles in overseeing the program and how they expect to ensure the program's continuation once they have retired. Additional interviews with members of the Student Board of Directors from previous years will also provide more information as to why no students applied for the 2015-2016 academic year.

With regards to student preferences, future research should look into different ways to collect student preferences and pre-consumer kitchen waste information. A more efficient system to determine what students are eating, what they would prefer to eat, and how much they are eating will help improve Sodexo services. The more frequently this information is collected, the more accurate it will be. This will reduce costs, secure higher student satisfaction ratings, and, most importantly, reduce waste.

7.6. Contacts

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7.8 Appendices

7.8.1 Student Preferences

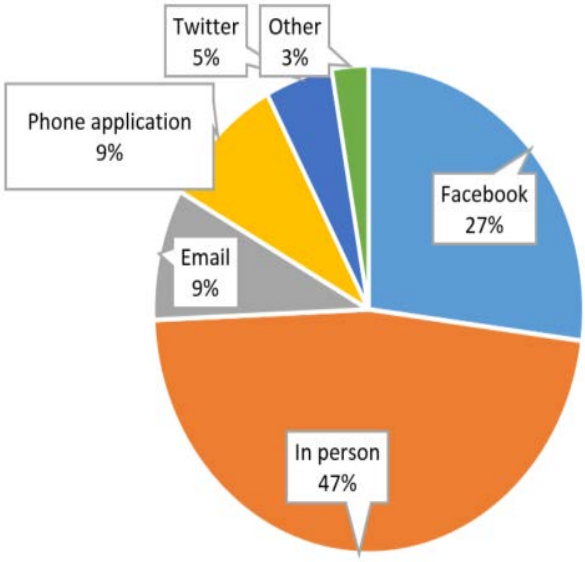

Figure 7.19: *2016 Smoothie Workshop Survey: "What would be the easiest way for you to share your food preferences?" 187 students responded to this question.*

7.8.2 Educational Components of the April 14, 2016 Weigh the Waste Event

Listed below are just some of the comments students wrote down on our comment board in reaction to the Weigh the Waste event held on April 14th, 2016:

"This is SO important. Ahhhh thanks for what you bring to our attention!"
"Only take what you'll EAT!"
"Thank you for being green."
"It's sad to see how much food (that could go to families who can't afford food) goes to the trash."
"Don't waste. There are starving kids."
"Waste kills."
"Great job! World hunger is a real thing. Eat your food!"
"Be grateful for food!"
"We take a lot of things for granted."

Figure 7.20. *One of the five educational posters displayed at the Weigh the Waste event on April 14th, 2016.*

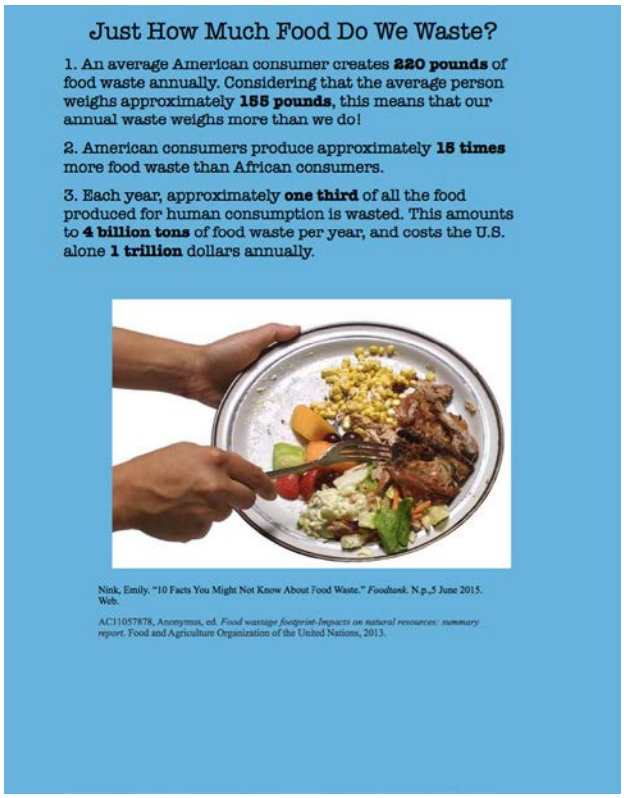

Figure 7.21. *One of the five educational posters displayed at the Weigh the Waste event on April 14th, 2016.*

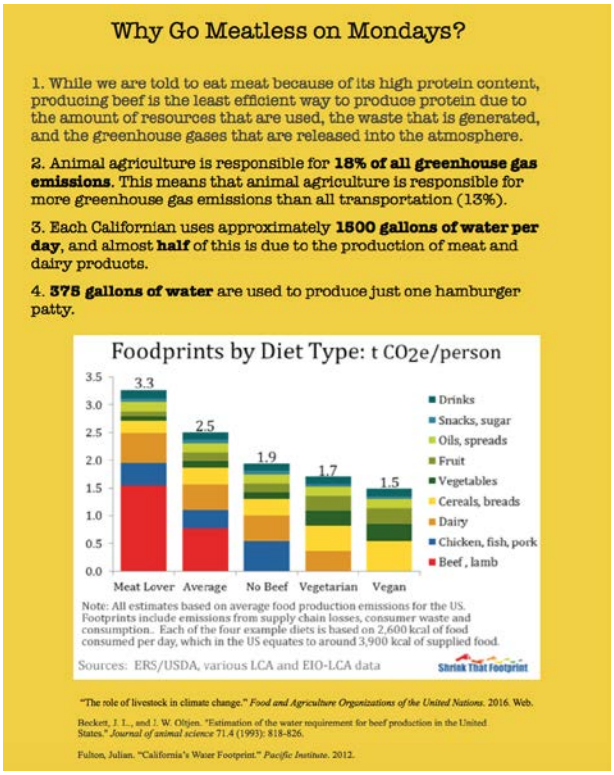

Figure 7.22. *One of the five educational posters displayed at the Weigh the Waste event on April 14th, 2016.*

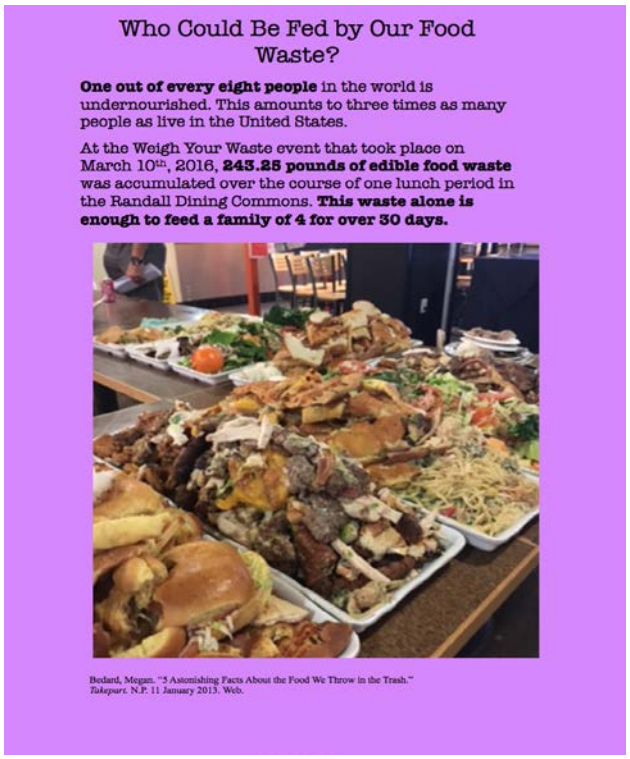

Figure 7.23. *One of the five educational posters displayed at the Weigh the Waste event on April 14th, 2016.*

Figure 7.24. *One of the five educational posters displayed at the Weigh the Waste event on April 14th, 2016.*