Chapter 3: Dining Services

3.1 Introduction

The level of food sustainability in most areas depends on where the food supplies are coming from, how they are transported, and in the disposal processes of pre and post-consumer wastes. Each of these generalized steps in the supply of food for dining services also has an environmental cost which can be minimized when considered from a more sustainable perspective. The often hidden cost of food production is in the carbon pollution emitted by food production systems (UC Berkeley Environment and Sustainability Portal). Thus, when purchasing food, it is important to consider buying locally to reduce transportation time and emissions as well as to support local farms and produce suppliers. In addition to buying local, the types of foods being consumed have a profound impact on the environment as well. For example, those who eliminate meat from their diets just one day per week reduce the same amount of greenhouse gas emissions as driving 1,000 miles less per year (Carnegie Mellon: Where's the beef). Together, the processes required to make food, the transport of the food supplies to consumers, and the disposal processes contribute to greenhouse gas emissions like methane and carbon dioxide.

In 2010, more than 34 million tons of food waste was generated, more than any other material category besides paper. Food waste accounted for almost 14 percent of the total municipal solid waste stream, less than three percent of which was recovered and recycled in 2010 (US Environmental Protection Agency). In an effort to decrease the amount of food wastes put into landfills and greenhouse gas emissions, it is important that Chapman University makes sustainable changes to reduce campus waste and increase food sustainability. Overall, food sustainability in relation to dining services must be considered when creating a more environmentally aware and focused campus.

This chapter of the audit will provide an overview of how Chapman University in recent years has made progress towards sustainability in dining services and initiatives. The following topics will be covered in addition to any possible recommendations and existing gaps in knowledge by the end of the chapter:

- Chapman's dining service history and sustainability movements
- Chapman's partnership with Sodexo
- The newly added Enviropure waste system
- Pre and post-consumer waste data
- The presence of a campus garden and Tanaka Farm boxes
- Student opinion of dining services and sustainability

3.2 History of Dining Services at Chapman

3.2.1 Overview

From 2009-2012, a survey was taken by Chapman students to gain insight into how the campus viewed the importance of sustainability. Provided by the Cooperative Institutional Research Program (CIRP), the conclusions of the survey suggest that freshman and seniors have somewhat varying views towards environmental action. Although sample size varied, in 2012, 30.1% of freshman felt that adopting green practices to protect the environment was "very important," while 39.4% of seniors felt the same way. However, for the seniors who were administered the same survey in 2009, this was a 4.5% rise in their views towards adopting environmental practices.

Specifically, sustainability in dining services at Chapman has progressed somewhat slowly over the past ten years. Beginning with the switch from Aramark to Sodexo in 2002, the creation of different pre and post-consumer waste measurement systems, waste disposal devices, and various on-campus initiatives has continued campus progress. In addition, according to the 2013 Chapman Environmental Audit Survey taken by students of all academic levels at Chapman (n=977), 43.3% of respondents felt that consuming locally grown food was important to them on campus. This is statistically consistent with the results of the CIRP survey and further emphasizes the importance of continuing sustainability efforts on campus, specifically in dining services.

3.2.2 Past accomplishments

Sodexo is the main food provider for all of the on-campus dining areas listed below:

- *Randall Dining Hall* (Sandhu Resident Center) - Chapman's main dining cafeteria located in the Randall Resident Hall. Meals vary by day.
- *Einstein Bros Bagels* (Argyros Student Union) - Bagels, sandwiches, salads, coffee and more.
- *WOW Cafe & Wingery* (Argyros Student Union) - Appetizers, wraps, salads, Angus burgers on Texas toast, southwest items including: quesadillas, fajitas and wings, tenders and shrimp.
- *Subversions (Beckman Hall)* - Fresh, made-to-order sandwiches, chips and snacks.
- *Jazzman's Cafe & Bakery (Beckman Hall)* - Fresh baked items including muffins, croissants, cookies and gourmet coffee and juices.
- *Jamba Juice (Argyros Forum)* – Smoothies, juices, oatmeal, and wraps.
- *Rotunda (Leatherby Library)* - Coffee and snack options.
- *Doy's Place (Henley Resident Hall)* - A convenience store located in the residence hall offering sandwiches and other late night food options.
- *Attallah Piazza Grill Cart (Attallah Piazza)* - Gourmet street style hotdogs.
- *West Palm Café (West Palm Offices)* - Coffee, snacks and cold lunch items located off West Palm.

Going trayless

In an effort to reduce food waste in the previous cafeteria location of Argyros Forum, Chapman dining went trayless in 2007. Going trayless in the cafeteria reduced the likelihood of students placing more food on their trays than they will consume, thus reducing food waste and water usage for dish cleaning among other issues.

The new Randall Dining Hall

The new Randall Dining Hall was constructed in the Sandhu Resident Center, opening in 2009. The move to Randall provided students in the residential area with a more modern and convenient location to dine as described by Jennifer Harris, Marketing Director for Restaurant Services at Chapman.

Student Union dining areas

In the Fall of 2011, three more dining areas were created in addition to the already present seven. Also, in 2012 food trucks (supervised by Sodexo) were allowed on campus in the Attallah Piazza on certain days of the week.

Ban on Styrofoam and black plastic dining ware

A campus-wide ban on the use of Styrofoam and black plastic dining ware at campus functions was approved by the Faculty Senate on February 19th, 2010 with an 81% majority vote. Effective on June 1, 2010, all on-campus events were no longer allowed to use the non-sustainable serving ware,

but instead were provided “greenware” to use. Greenware is compostable and made from biodegradable materials such as corn starch. In dining areas where the greenware is not provided, reusable ceramic, glass, and metal serving ware is utilized.

According to Dr. Christopher Kim, Associate Professor in the Schmid College of Science and Technology, Styrofoam and plastic serving ware are made of non-renewable resources and require more energy to manufacture than the greenware currently used at Chapman. This environmentally responsible decision to prohibit the use of these materials on campus is an important step in many of Chapman’s efforts towards improved sustainability in dining services.

The Enviropure

Most recently, in the Spring of 2013, the previously used trash compactor in the Randall Dining Hall was replaced with an on-site organic waste conversion food digester. The food digester, known as the Enviropure system, reduces the University’s yearly waste hauling costs as well as greenhouse gas emissions (See further detail in section 3.3.4).

Before the installation of the Enviropure system food composting was considered at Chapman. However, composting was found to be unfitting by the Sustainability Manager, Mackenzie Crigger for the following reasons:

- Lack of adequate storage capacity for the composted waste.
- Chapman’s waste disposal company CR&R does not provide composting services. Outside vendors do, however they were not capable of making pick-ups as frequently as Chapman would need according to the amount of waste generated.
- Chapman is tied to the City of Orange’s contract with CR&R. Therefore, the campus must comply with CR&R regulations which prevent Waste Management from picking up the compost despite having an anaerobic digester three miles from campus.
- In 2011, attempts were made to create an agreement between CR&R and Waste Management which would allow Chapman to contract with Waste Management to pick-up the compost, but no agreement was established.
- CR&R attempted to develop a compost loop in Orange including Chapman and some of the local businesses; however, due to monetary complications the idea was terminated. In addition, the compost taken by CR&R would have been transported for two hours into the desert. Therefore, the good of composting would be largely voided by the emissions and costs associated with hauling.

3.3 Current Status of Dining Services at Chapman

3.3.1 Chapman’s partnership with Sodexo

Since 2002, all food and dining services have been provided and/or managed by Sodexo. In addition to other sustainability initiatives taken by Sodexo, all equipment used for dining services must be Energy Star® efficient and food is sourced locally when possible (defined to an area of 150 miles around Chapman).

The main supplier for meats, dairy, grocery, and general paper products comes from Sysco which delivers four times a week to the campus. Sysco is considered the standard for Sodexo although not all of their supplies are locally sourced. About 25% of the fresh chicken product that Sodexo orders is local, but this number can fluctuate by 5% either way according to Steven Anderson, Kitchen Manager in the Randall Dining Hall. In addition, various meat orders come from the Newport Meat Company, which is considered to be a local supplier and is based in Northern California. According to Anderson, the Newport Meat Company can deliver the next day and is often used for catering purposes, culinary courses at Chapman, and for backup orders of meats when needed.

Produce served in dining areas is provided by Freshpoint, a locally based produce and cheese supplier for many areas in Orange County. Specialty products such as gluten free items come from United National Foods Incorporated. Dawn Bakery is also used for food supplies in the dining areas and cafeteria. Coffee used in the dining hall and in Jazzman's is fair trade Aspretto brand coffee and is sustainably sourced. (See Aspretto and Freshpoint's website listed at the end of this chapter for further information).

All catered events at Chapman rely on the same food suppliers and sources for dining services. There are, on average, around 60 catered events per week during a typical semester. Argyros Forum, Beckman Hall, Sandhu, and the Law and Film School hold 75% of all catered events throughout any given week. According to Steve Anderson, catering events are held at many other areas from off-site Chancellor House dinners to faculty breakfasts in the Hutton Sports Center to Memorial Lawn for American Celebration. In addition, uneaten meals prepared for catered events are donated to Second Harvest.

The Better Tomorrow Plan

Sodexo follows a set of guidelines that serve as an environmentally conscious roadmap towards maintaining sustainability. Taken from Sodexo's website (sodexousa.com), the guidelines are listed below:

- We will (Sodexo) reduce our carbon footprint in all the countries where we operate and at clients' sites by 2020
- We will reduce our water footprint in all the countries where we operate and at clients' sites by 2020
- We will develop and promote health and wellness solutions for our clients', consumers, and employees in all the countries where we operate by 2015
- We will advocate balancing meal options at all of our clients'' sites by 2016
- We will source local, seasonal, or sustainably grown and raised products in all the countries where we operate by 2015
- We will provide and promote choices with a reduced intake of sugar, salt, and fats at all our clients' sites by 2015
- We will increase the purchase of products sourced from fairly traded certified sources by 2015
- We will source sustainable fish and seafood in all the countries where we operate by 2015
- We will source and promote sustainable equipment and supplies in all the countries where we operate by 2020
- We will reduce organic waste in all the countries where we operate and at clients' sites by 2015. We will support initiatives to recover non-organic waste
- We will ensure compliance with a Global Sustainable Supply Chain Code of Conduct in all the countries where we operate by 2015
- We will support local community development in all the countries where we operate by 2015
- We will fight hunger and malnutrition through our STOP Hunger Initiative in all the countries where we operate by 2020

These guidelines are enacted at Chapman in various ways including:

The Lean Path

The Lean Path software is an important way that Chapman measures pre-consumer waste or food that is not eaten, during meal preparation in the Randall Dining Hall. After a series of pilot studies took place in eight different colleges from 2010-2011 (Coe College in Cedar Rapids, Iowa, California State University of Monterey Bay in Seaside, Calif., Juniata College in Huntingdon, Pa., Linfield College in McMinnville, Ore., Marist College in Poughkeepsie, N.Y., Pomona College in Claremont, Calif., University of California at Davis, Calif., and University of Wisconsin in River Falls, Wis.) the Lean Path software was implemented at Chapman in 2012. The new software has proven beneficial to University's continued sustainability efforts, although it is still in the beginning stages. Food that is not used during preparation or capable of being used at another time is thrown away.

However, Lean Path allows Sodexo and kitchen employees to measure what it is they are throwing away and record over time any changes in disposal or preparation practices. According to Jennifer Harris, “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,” These measurements are taken since the implementation of the Lean Path in the Fall of 2012 through the first week of April 2013 (See leanpath.com for further information).

Weigh Your Waste

Beginning in 2012, in addition to measuring pre-consumer waste, Chapman has held Weigh Your Waste events to quantify how much food is discarded by students post-consumption. Volunteers alongside Sodexo employees work from 11:30am until 1:30pm on certain days each month to measure how much organic food waste is being disposed of. Four separate bins for edible, inedible (peels, pits), liquid, and miscellaneous wastes (napkins, tea bags, stir sticks) are filled as students place their plates on a table rather than directly into the dishwasher line.

According to Resident Dining Manager Jayme O’Neil, anywhere from 2,500 to 3,000 plates are served during a 2 hour lunch period at Chapman (breakfast is around 250 to 500 plates). In February of 2013,163.71 lbs of waste was created during a 2 hour lunch period. One month later, 172.4 lbs of food waste was recorded (**Figure 3.1**). On average, 168 lbs of food waste is produced each lunch period at Chapma. During a five day school week, this means around 840 lbs of food wastes are disposed of and taken to landfills by CR&R. In total, this would mean around 58,800 lbs of waste created each semester by students in the Randall Dining Hall. In order to reduce this amount, students need to be aware of the importance of the Weigh Your Waste results (Photos of the event are shown in **Figure 3.2**). Also, the addition of the Enviropure food digester (section 3.3.4) will greatly reduce the amount of food waste being put into landfills.

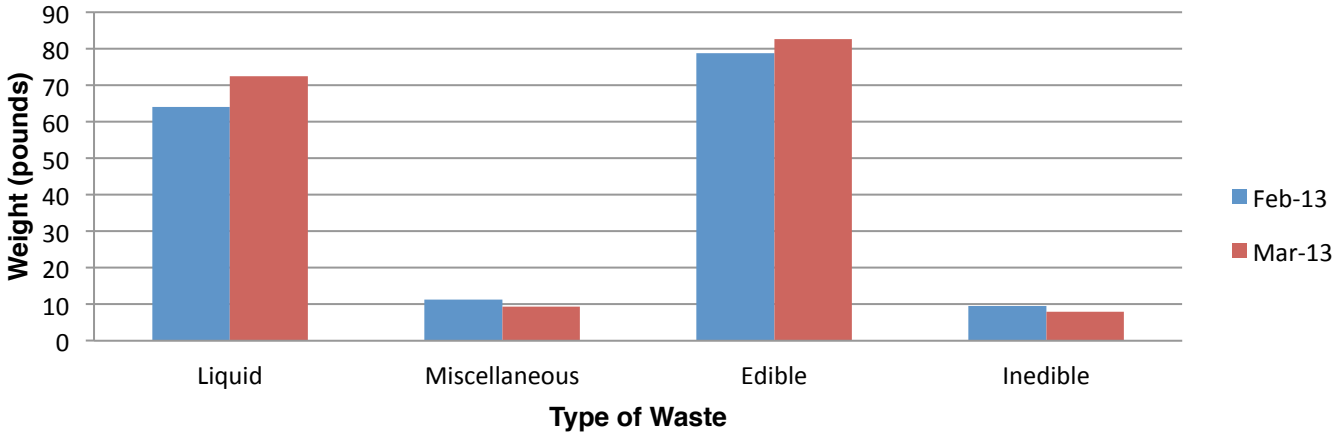

Figure 3.1. *Graph of Weigh Your Waste data from events held in February and March 2013.*

3.3.2 Other Sustainable Dining Initiatives

Meatless Monday- Each Monday the Randall Dining Hall places educational posters around various food stations in the cafeteria to promote meatless meal options and the environmental benefits. According to Jessica Hewes, Food Intern at Chapman who works closely with Sodexo, “Giving up meat once a week can save precious resources in many ways.” According to PETA, meat and dairy products require more resources and generate more greenhouse gasses than do plant-based foods. In addition, the combustion of fossil fuels such as gasoline and diesel to transport goods is the second largest source of carbon dioxide emissions in the United States (EPA). In 2011, burning fossil fuels accounted for about 31% of total U.S. carbon dioxide emissions and 26% of total U.S.

greenhouse gas emissions. Because transporting meat from farms, to sellers, and finally to consumers generally involves the use of gasoline, consuming less meat will benefit the environment by reducing carbon dioxide and greenhouse emissions. To further promote this concept, meatless recipes are posted on Chapman's Dining's Facebook page, Twitter account, Instagram, and with informative posters throughout the dining hall (**Figure 3.3**).

Figure 3.2*. Images taken at the March 2013 Weigh Your Waste event in the Randall Dining Hall.*

Just Ask Initiative- Similar to Meatless Monday, signs are posted at food stations encouraging students to ask for different meal options such as whole wheat pasta, half portions, vegetables, no sauces, and other choices that can benefit their health and reduce wastes from uneaten food. Almost one-quarter of all freshwater use in the United States is attributed to post-consumer wastes (PLOS). Additionally, rotting food in open landfills releases significant quantities of methane, a greenhouse gas with a warming potential that is 20 times greater than that of carbon dioxide (EPA). By students actively choosing to customize their meals, less food waste will be created at Chapman University.

Vegetarian/Vegan stations- Certain stations in the cafeteria offer vegan or vegetarian meal options for the convenience of diners and the health of the environment. While only 2.1% of students claim to be vegan and 9.1% vegetarian according to the results from the 2013 Chapman Environmental Audit Survey, the value of these meal options are important nonetheless.

Figure 3.3. *Images of educational signs advertising sustainable dining information in the Randall Dining Hall.*

3.3.3 Food Transparency Agreement and Real Food Calculator

In order to advance supply chain transparency on the Chapman campus, Sodexo has agreed to make further improvements towards sustainability in food practices. The Food Transparency

Agreement will put in place a comprehensive set of standards, defined by the Real Food Calculator, for judging the social responsibility and sustainability of Sodexo's vendors and food producers. With the addition of this new agreement, students will have better access to information on Sodexo's food providers and how sustainable their food choices are. According to the Real Food Calculator website, "real" food is defined according to four attributes: local and community based, fair trade, ecologically sound, and humane. This criterion is unique to each campus depending on where the food is purchased and allows campuses like Chapman to see areas in need of more "real" food purchasing. After the different foods are evaluated under the four sets of criteria, a distinction is made between those that qualify with one or more of the standards. By recognizing "real" foods, a distinction can be made in an effort to realize how successful food choices are in terms of sustainability. While this does not immediately mean a change in food supply, it does indicate progress towards acknowledgment and possible change in the future (for more information on the Real Food Calculator visit realfoodchallenge.org).

3.3.4 Enviropure Food Digester

During the Spring of 2013, a new organic waste management system replaced the previous food waste compactor located behind Randall Dining Hall. The purchase and installation cost of the 1,200 lb. Enviropure wet system to Chapman was $47,000. The cost to own and operate the previous trash compacting system at Chapman was around $16,000 each year (In addition to maintenance costs, CR&R picked-up food wastes every seven days to be transported to landfills from the old compactor). With the new food digester, the pre and post-consumer wastes will instead be incorporated into a recycling system (which is free). In addition, the costs to run the Enviropure are essentially negligible, according to Mackenzie Crigger. Thus, the $16,000 previously required to transport wastes each year from the compactor will be paid back within three years by the $47,000 Enviropure.

The unit requires hot and cold water access, sewer access, and electric power. During an active 24 hour period, the unit will consume around 100-200 gallons of water and will discharge around 400-500 gallons after organic waste consumption. The waste water is emitted directly into the sewer system where it will eventually be treated by the OC Sanitation District. The Enviropure is capable of processing a constant input of food waste. Once dropped in, the food waste will be decomposed by microbes in the machine and by other physical and biological processes in a submersed environment, breaking down the waste into water and carbon dioxide. It is then released as grey water into the sewer system to later be purified. The amount of water returned to the eco-system actually increases because of the manner in which the machine extracts it from the organic waste input. In addition, the effluents and suspended solids created are well below EPA requirements; however, the Enviropure does require a Biomix additive and is not capable of digesting pits, corn husks, or pineapple tops. **Table 3.1** shows a summary of municipal limits of waste discharge and what the Enviropure system discharges:

Table 3.1. *EnviroPure discharge limits per 24 hour cycle.*

Waste Water Discharge Criteria	Municipal Limits (mg/L)	Eco-Safe Effluents (mg/L)
Bio-chemical Oxygen Demand	25-30	25-30
Fats, Oils and Grease	100-150	0-10
Total Suspended Solids	300-500	25-35

As seen in **Figures 3.4a-b**, the digester works by using natural biological decomposition processes. Water is released by a continuous grinding of the food waste which reduces particle size

and ultimately assists in the breakdown of the food waste. Aeration of the chamber where waste is contained provides oxygen and aerobic conversion of carbon components to carbon dioxide. **Figures 3.5a-b** show what the system looks like and where the waste water is emitted from.

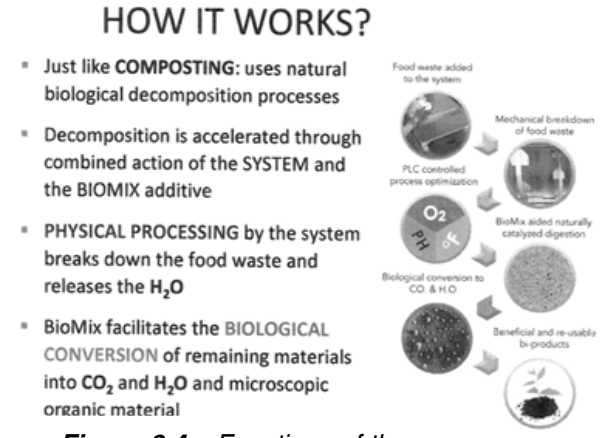

Figure 3.4a. *Functions of the Enviropure system.*

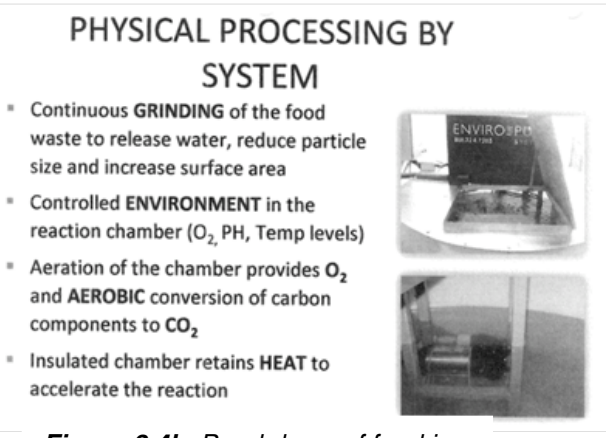

Figure 3.4b. *Breakdown of food in the Enviropure.system.*

Figure 3.5a. *The newly installed Enviropure system in the kitchen of the Randall Dining Hall*

Figure 3.5b. *Area where waste water is emitted from the Enviropure and into the sewer system.*

3.3.5 Campus garden

Chapman has a small campus garden located between the Davis Resident Apartments near the Sandhu building and Randall Dining Hall (see **Figure 3.6a-b**). Initiated in the Summer of 2012 through the efforts of Micol Hebron, the garden grows a variety of fruits such as Grenada Pomegranate, Fuyu Persimmon, Blenhem Apricot, Satsuma Mandarin, Hass Avocado, Bearss Lime, Eureka Lemon, Fuji Apple, Mexican Guava, and Washington Navel Orange. In addition to produce cultivation, the garden is also used for scientific purposes at Chapman such as experiments in the Ecology course among others. The six members of the Campus Garden Committee, Dr. Geraldine McNenny, McDonough Monroe, Angel Flores, Chris Hutchison, and Dr. Jennifer Funk all oversee the garden.

A larger campus opening for the garden is scheduled for May 3, 2013. While small in size, the potential for the long-term growth of this garden could improve student awareness, education, and action towards eating local in addition to the overall campus environmental sustainability.

Figures 3.6a. *The campus garden in the Davis Residential area.*

Figure 3.6b. *One of the fruits currently growing in the garden.*

3.3.6 Community Supported Agriculture (CSA) Boxes

In 2011, Chapman joined the Tanaka Farm's Community Supported Agriculture (CSA) Program to support a local organic farm. Between September 7, 2011 and April 3, 2013, a total of 971 orders were made by students and faculty at Chapman (See **Figure 3.7**). To date, there are 52 subscribers to the CSA program. Generally, the boxes are delivered twice a month and picked up by the purchaser on campus. . The deliveries contain a variety of the Farm's seasonally and locally grown organic fruits and vegetables. As explained on the Tanaka Farms website, the product is as follows:

- A box of farm fresh produce/fruits using organic farming methods
- The majority of the freshly picked produce is grown by Tanaka Farms located in Irvine. Produce/fruits will be supplemented from other organic farmers to provide a good variety in each box
- Produce is delivered to a specific location (Chapman campus) either once a week or every other week where it is picked up by the subscriber (students and faculty who order)
- Subscribers do not have a choice as to what they receive each week
- The cost to the subscriber is $30 for the large box and $20 for the small box plus a delivery fee of $3 per box unless it is picked up directly from the farm

In addition, 10% of each box order is given back to The Green Initiative Fund (TGIF) at Chapman to support pilot sustainability programs.

3.4 Concluding Assessment

3.4.1 Areas of progress

Chapman's dining services in the past ten years have continued to become sustainable. This has improved student environmental awareness, although further progress in this area can be made. With the recent addition of Lean Path Software as well as the continued Weigh Your Waste Events, Chapman is working to increase awareness and decrease pre and post-consumer waste. The move to greenware and going trayless supported these efforts in accordance with Meatless Monday, the Just Ask Initiative, and the vegan/vegetarian meal options. Chapman's partnership with Tanaka

Farms and the creation of a campus garden further shows efforts to consume locally grown goods and gain student involvement. The recently-made agreement by Sodexo to increase transparency in the food supply chain at Chapman will allow students the opportunity to investigate and understand where their food is coming from and what the environmental implications of their meal choices are. Finally, the Enviropure organic waste system is also an improvement in the disposal of food wastes in the dining hall.

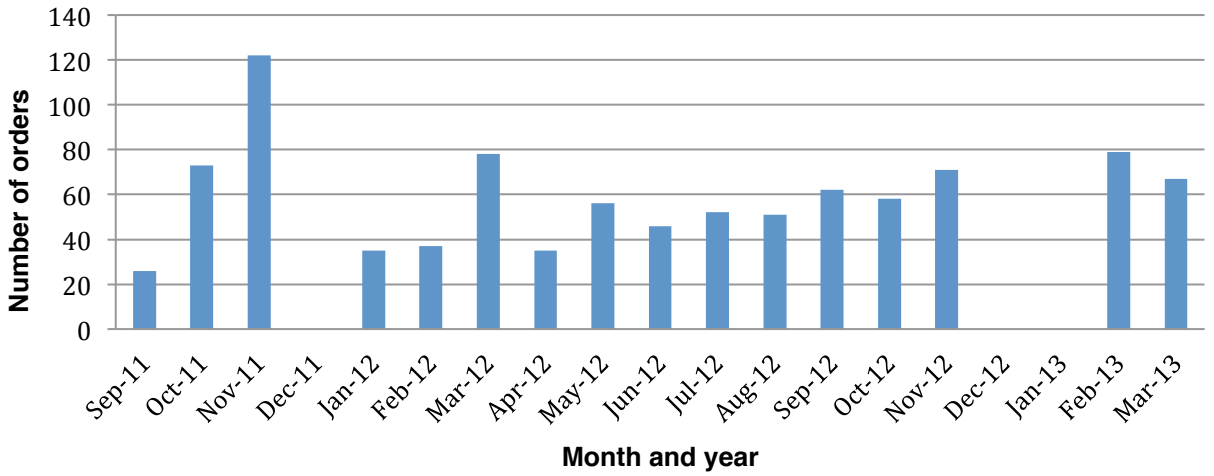

Figure 3.7. *Number of Tanaka box orders by students and faculty each month since September 2011.*

3.4.2 Areas in which to improve

Areas in need of improvement are largely based around what is being done with Lean Path and Weigh Your Waste data once it is obtained. Record keeping and comparisons of month-to-month data from these programs should be stored in a database and/or made available online where students, Sodexo, and faculty can view the results. In addition to keeping the numbers, students need to be more compelled to take action in waste reduction efforts at Chapman. Increased student awareness and appreciation towards the changes going on in dining areas and through various contracts would improve the campus sustainability mind-set as well. If more education as to why sustainability is important was provided to students, they would be more likely to take action at Chapman.

Also, the campus garden if given more recognition and promotion has the potential to be expanded and supply many students with locally grown campus foods. On a much larger scale, however, a valuable example nonetheless is in the University of California Davis' garden. UC Davis has chosen to include "Campus Grown" foods into their campus sustainability criteria. Their Student Farmers Market Garden provides fruits and vegetables to all three resident dining commons on campus as well as various cooking supplies to some of the meals prepared in the dining areas. Students at Davis are able to learn about edible plants, how they are grown and cared for, and how they can be prepared after harvesting by direct interaction with the garden (For more information on UC Davis' garden visit their website at studentfarm.ucdavis.edu). Given the chance, the Chapman garden could most definitely improve campus sustainability and provide the community with the ability to choose locally grown fruits in ways similar to UC Davis. In its most immediate form, the Chapman garden could provide a hands-on means for furthering students' food sustainability education.

Overall availability of information on waste numbers and food life cycles at Chapman would be beneficial for further research and use. The Food Transparency Act and Real Food Calculator described in section 3.3.3 will provide this information in the years ahead.

Advertisement towards efforts such as the move from the food compactor to the new Enviropure food digester could also bring more involvement and pride to the student-side of the sustainability movement. A concise list of where food is purchased and amounts each week would be useful to further investigate and analyze the environmental life cycles of foods.

3.4.3 Existing gaps in knowledge

Areas in need of further data are the Lean Path records as well as Weigh Your Waste data. A complete record of all measurements should be kept and easily accessible to students and faculty. Without understanding what has happened in the past with regards to pre and post-consumer food waste, providing concrete evidence of positive changes through either of these two practices is challenging.

Data was also unattainable with regards to how much money is spent in total each year on campus dining services. A rough estimate based on monthly spending was given at around $672,000 by Steve Anderson, however this number could fluctuate around $100,000 more or less each year. Knowledge of this data could possibly provide insight into areas that are of high cost to the campus, allowing alternative and more sustainable orders or purchases to be made.

In addition, numbers on how much money is spent according to food and product type wasn't readily available. Along these lines, catering services did not provide specifics on amounts of food wastes created at events.

It would also be of interest to know how going trayless in 2007 changed food waste numbers in the following years. Knowledge of how Meatless Mondays alter food preparation or waste data is not kept, but could prove to further show students how their actions are important outside of simply reading signs posted in the dining hall. In addition, students will be more likely to make changes in their food choices and resulting wastes if held to a higher degree of accountability once provided with this knowledge. Finally, the Real Food Calculator should be applied to all food sources at Chapman to investigate sustainability and food life cycles. The results should be made available to students and faculty. In addition, any changes following the Real Food Calculator results should be brought to campus attention as well.

3.5 Recommendations

3.5.1 Low cost/effort

Quick ways to improve dining sustainability at Chapman would be as follows:

- Promote and explain to students (through email, entries in the *Panther*, or by widespread word of mouth) the Lean Path and Weigh Your Waste data.
- Start a competition between resident halls to see who leaves the fewest pounds of waste during a lunch period in the Randall Dining Hall. Provide a campus or community based incentive to do so resulting in further acknowledgment of the Weigh Your Waste program.
- Explain to students that dishes can be customized in the cafeteria to fit specific wants. One possibility may be asking the chefs to obtain feedback about how diners prefer their dishes.
- Post announcements about the importance of the establishment of a campus garden in a school wide email. In this email, explain the environmental efforts that Chapman is making and how consuming produce from the garden will make each student an active participant (**Figure 3.9** located in the Appendices).

3.5.2 Moderate cost/effort

Challenging, but feasible ways of improving food sustainability could be as follows:

- Label every food or meal option provided in all dining areas on campus as locally grown or sustainably harvested and transported. Also provide the environmental impact of various food choices (**Figure 3.10** located in the Appendices).
- Provide incentives to students who bring reusable containers to take leftovers back to resident halls that would otherwise be thrown away. As an example, the University of California, Irvine, allows students a reusable "clam shell" container to be filled with food and taken throughout the students' day. Once used, the containers are then returned to the cafeteria where they are washed and able to be used continually by the student population.
- As in the case of UC Davis, provide healthy, locally grown Tanaka or campus produce in the vending machines around campus. This will encourage the purchase of sustainable foods and healthy eating.
- Provide and promote on-campus internship opportunities in food sustainability and preparation for course credit.
- Create a section dedicated to food and campus sustainability in the *Panther* where on-campus related dining events can be explained in detail to students and faculty.
- Transfer all on-campus food wastes outside of the dining hall to the Enviropure to be digested and recycled.

3.5.3 High cost/effort

More costly, but important recommendations towards furthering dining sustainability are:

- Provide food donations from Chapman students to local food banks. This could be done by allowing students in dining areas to donate unused "swipes" from their meal plans back to the school to then be donated. This would increase Chapman's efforts to be globally and community aware by helping out locally. The money should be donated to food banks that buy locally grown or sourced foods in order to provide meals to those in need.
- Create a variety of freshman foundation courses based on sustainable and environmentally aware dining services. The courses should focus on the global importance of such decisions and how individual action can have an impact on the environment and the availability of food for current as well as future generations.
- Put the $16,000 that was once used for food compacting strictly towards sustainable initiatives on campus. This could help in many other areas mentioned in this audit as well in addition to possible garden expansion, buying from more local producers to reduce transportation costs and carbon dioxide emissions, creating resident hall waste reduction competitions, adding courses at Chapman focused on sustainability education.

3.5.4 Future areas of research

Future areas of research involve finding out how much money is spent on dining services at Chapman throughout each semester. Categories of the different types of foods and goods ordered should be kept and their total cost to the campus calculated. These costs should then be compared to overall amounts of waste created (both pre and post-consumer) using the Lean Path and Weigh Your Waste Programs. In addition, their environmental life cycles should be traced with the assistance of the Real Food Calculator. Possible areas of sustainable change should be identified and considered after viewing these results. In accordance with the Food Transparency agreement, an overall assessment of the food choices purchased by Chapman (once identified on a more specific and quantitative level) should be considered using the Real Food Calculator. By tying in all of the various dining sustainability programs and the efforts being made by Chapman, a more effective and impactful assessment of dining services on campus can be made. To do so, records must be kept in these various areas and available to the Chapman community. Any updates, changes, program

additions, or dining sustainability actions by the campus or Sodexo should be brought to the awareness of students and faculty by social media, email, and/or word-of-mouth.

Research into the use of the campus garden and its possible expansion over the coming years should be made. The popularity of certain meals offered in the cafeteria and other areas should be surveyed. Once these results are obtained, the ingredients for these meal choices should be analyzed and any possible sustainable changes made. Also, within three years, acknowledging how the money saved through the Enviropure is being used will be of importance.

Knowledge of how many meal plans at the beginning of each semester vs. how many meals are actually consumed would prove valuable as well. In the reduction of waste (both pre and post-consumer) changes in the amount of food being ordered or kept in the kitchen that possibly goes unused could be managed by knowing differences between meal plans and actual number of plates served.

3.6 Contacts

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3.8 Appendices

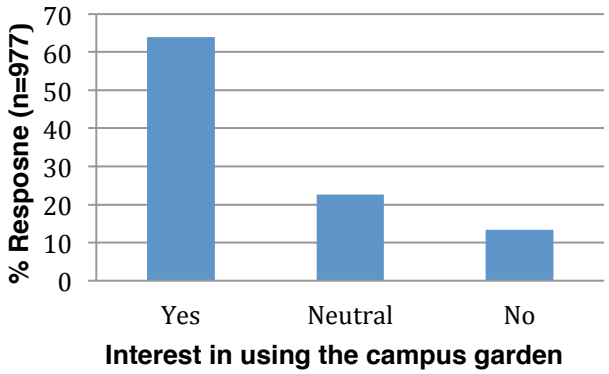

Figure 3.9. *Percentage of students who answered the 2013 Chapman Environmental Audit Survey question- "Would you use a campus garden to pick certain fruits and vegetables at your own convenience?"*

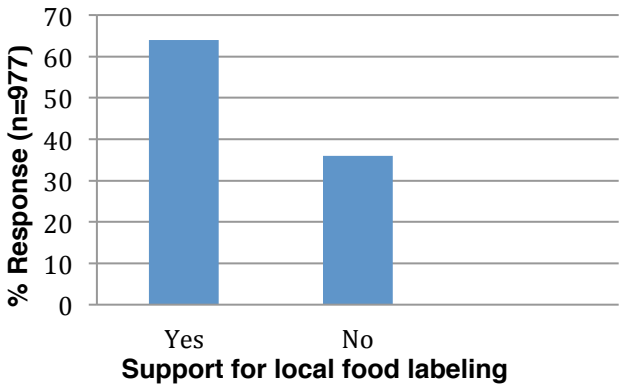

Figure 3.10. *Percentage of students who answered the 2013 Chapman Environmental Audit Survey question- "If foods in the cafeteria were labeled as locally grown, would you be more inclined to make meal choices from them?"*