

**Sustainability Analysis on the new Smith College Dining
System:
Grab 'N' Go vs. Non Grab 'N' Go Houses**

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Abstract

Food and food related product waste is a major concern throughout the world. At a local scale, it has become an issue at Smith College. This study conducted a sustainability analysis on the new dining system, the “neighborhood model”, implemented at Smith College in fall of 2004. We observed distinct partitioning in the amount of food and food related product waste generated by Grab ‘N’ Go dining halls compared to traditional dining halls at Smith. At two non-Grab ‘N’ Go, Chapin and Hubbard, and two Grab ‘N’ Go houses, Tyler and Cushing, we recorded the number of students attending per meal time and the amount of food waste and food related product waste in pounds for three random days over the course of two weeks. Both houses with Grab ‘N’ Go food service produced greater amounts of food and food related product waste per capita (Chapin 9.37 lbs per capita, Hubbard 5.61 lbs per capita). Conversely, houses with traditional dining service produced relatively few lbs of waste per capita (Tyler 5.51 lbs per capita, Cushing 5.15 lbs per capita). It is evident that the large quantities of waste being produced in Grab ‘N’ Go houses does not make the “neighborhood model” a sustainable system. Thus, we recommend changes the model toward a more sustainable system.

Introduction

Food is an essential product that needs to be managed in a sustainable manner. It is produced in large quantities, and similarly, it is carelessly disposed of in large quantities. Food waste is generated from food preparation wastes and uneaten food from households, commercial establishments, institutions, and industries. To reduce the amount of food waste and food related product waste, sustainable food service practices would need to be implemented. Essentially, to manage food and food related products in a sustainable manner, changes need to be made on how food is served, how much is served, what is done with leftover meals, food scrapings, trimmings, and food packaging waste.

For many developed countries, food is an indispensable resource. In the past, people were innovative when it came to using and saving up leftover food. Today, entire meals are tossed in the garbage. In the United States alone, over 10 million tons of food is disposed of annually (DPPEA 2004). In another astonishing figure, BBC News (2004) reports that in England about one third of the food grown for human consumption is thrown away and eventually ends up in landfills. Food that ends up in landfills causes more damage to the environment because leachate seeps into local aquifers contaminating groundwater. Moreover, the gases produced by food decomposition in anoxic environments are also an environmental hazard. Two alternatives to disposing food waste would be composting and simply reducing food waste. To apply composting and/or to reduce the amount of food waste requires implementing sustainable meal services throughout the world.

As the issue of food and food related product waste increases, so does the demand on academic institutions to implement sustainable practices. Orr (2002) believes that “more than any other institution in modern society, colleges and universities have a moral stake in the health, beauty, and integrity of the world our students inherit.” Health, beauty, and integrity should be addressed in decision making, especially when it concerns

sustainability. In this case, Smith College, as a leading liberal arts institution that prides itself in being the forefront of women's education and progress, lacks a sustainable dining system. Thus, it should find the means to reduce food and food related product waste on campus.

It is evident that food waste and food related product waste is a major concern throughout the world, but it is becoming a crisis at Smith College. In fall of 2004, Smith College decided to implement the "neighborhood model" dining system on campus (Smith College, 2004). The college proposed that under the "neighborhood model" in-house dining halls be consolidated from 25 to 18 in the next two years. The new system would also designate two dining halls as Grab 'N' Go during lunch. The remainder of the dining halls would remain as traditional dining services or non-Grab 'N' Go houses.

The "neighborhood system" was implemented for various reasons but four in particular. One of the primary reasons for the change was due to budget cuts. With the "neighborhood model" the college could achieve operational savings and remove renovation costs in a time when funds have become a limiting factor. Nearly \$800,000 of undergraduate dining budget was expected to be cut from spending under the new system. Another reason being associated with dining hall consolidation. Prior to the "neighborhood model", some smaller houses did not have their own in-house dining; therefore, students would eat at different houses. Even though the new system was indeed a change from the traditional dining model, it was implemented with the intention of facilitating the connection between students from different houses regardless if their house had in-house dining or not. Essentially, the college provides more dining options to students through this new dining system. Lastly, the new system would allow dining services to be more flexible to students' needs and food preferences. Once again, students have more options. They not only have an option on a dining location but they can also select what type of food to eat.

Since the "neighborhood model" has been in practice for one full academic year, it is important to evaluate the new dining system. The question now is, how sustainable is the "neighborhood model"? Therefore, the goal of this study is to conduct a sustainability analysis on the "neighborhood model". We will evaluate how much food waste and food related product waste is being generated by houses with Grab 'N' Go services compared to houses with traditional dining services (or non-Grab 'N' Go services). In addition, this study will make suggestions to make the "neighborhood model" a more sustainable system.

Methods

Data were collected in a two week period during the Spring 2005 from two Grab 'N' Go and two non-Grab 'N' Go dining halls to evaluate sustainability in the newly implemented dining system at Smith College. Houses were selected based on the system used to distribute food to students. We selected the only two Grab 'N' Go houses established (Chapin and Hubbard), and thus selected only two non-Grab 'N' Go houses (Cushing and Tyler) for comparison in this study.

For each house, three days worth of data were collected. The total number of students, 2.5 gallon bucket(s) of scrappings, and 60 gallon garbage barrels produced for a

specific day were recorded over the course of two weeks using a self designed data collecting sheet (Figure 1). We asked questions and took comments from kitchen and house staff. Student and waste averages were calculated for each house and graphed using Microsoft Excel. With the averages calculated, a daily total waste per capita was calculated and graphed for each house. We then multiplied the averages scrappings and garbage barrels by 8.3455 to convert gallons to pounds.

$$1\text{lbs} = 1\text{g}/\text{cm}^3 = 1\text{g}/\text{mL}$$

$$(1\text{g}/\text{mL}) (1000\text{mL}/\text{L}) (1000\text{L}/264.17\text{gal}) (2.20462\text{lbs}/1000\text{g}) = 8.3455\text{ lbs}/\text{gal}$$

Pictures pertaining food waste and food related product waste were also taken during data collection. In addition, we conducted interviews with various staff on the changes made to Smith’s dining system.

Figure 1. Data collecting sheet designed specifically to record student and waste amounts per house for all three days of data collection on Smith College.

Date	Chapin	Cushing	Tyler	Hubbard
No. of students				
Amount of food scrappings (2.5 gal bucket)				
Amount of food related packaging waste (60 gal barrel)				
Notes				

Results

In sum, we collected data from two Grab ‘N’ Go and two non-Grab ‘N’ Go houses on campus for this study, representing food waste and food related product waste. Total amount of waste in pounds and average number of students per house were used to analyze average waste per capita per house per day. The data indicate Grab ‘N’ Go houses produce more waste than non-Grab ‘N’ Go houses.

In an interview with Kevin Martin, we discovered that financial and operational changes were minimal. Amazingly, the amount spent on food is equivalent to previous years. The only difference is on what the money is allocated for, such that, houses feeding larger quantities of students purchase larger quantities of food compared to smaller houses. Unfortunately, financial data were not made available for the use in this study. With respect to kitchen staff, we were informed that staff was not cut, instead was distributed to other positions throughout Smith Dining Services. In addition, Martin mentioned that Smith has recently switched to a new produce provider. The new provider purchases its produce from farms located throughout the Connecticut Valley. The switch allows kitchens to purchase portions of produce instead of in bulk.

Student Averages per Meal

The average number of students attending each house during meal times varied (Figure 2). For breakfast, Tyler receives the greatest number of students with an average of 252 students. Hubbard serves an average of 165 students, Cushing 86 students, and since Chapin does not serve breakfast, it does not serve any students. Regardless of

Chapin not serving breakfast, it receives the greatest amount of students during lunch with an average of 689 students. At much lower students averages, Tyler serves 258 students, Cushing 166 students, and Hubbard 142 students. In addition to breakfast, Tyler also serves a greater amount of students during dinner than the other three dining halls, with an average of 237 students a day. Cushing serves an average of 152 students, Hubbard 142 students, and Chapin 64 students a day.

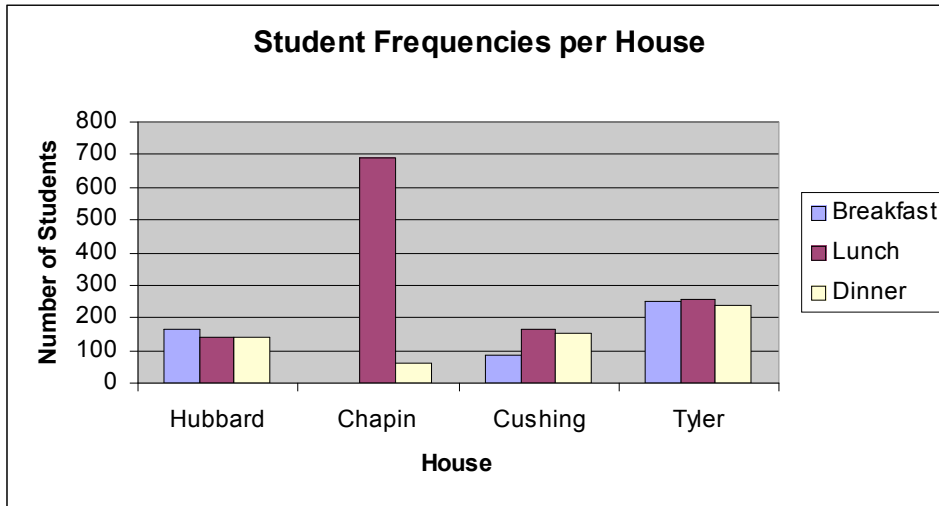


Figure 2. Distribution of student frequency averages per meal per house. Student frequencies are tallied daily by having students swipe OneCards prior to every meal.

Waste Produced per House

Similar to student averages per meal per dining hall, the average amount of food waste and food related waste produced per day show variability between houses (Figure 3). The house with the greatest amount of waste produced per day, which includes waste from food scrapings and garbage barrels, is Chapin with 7000 lbs. Houses that produce less waste per day are Tyler with 4000 lbs, Hubbard with 2,500 lbs, and Cushing with 2,500 lbs.

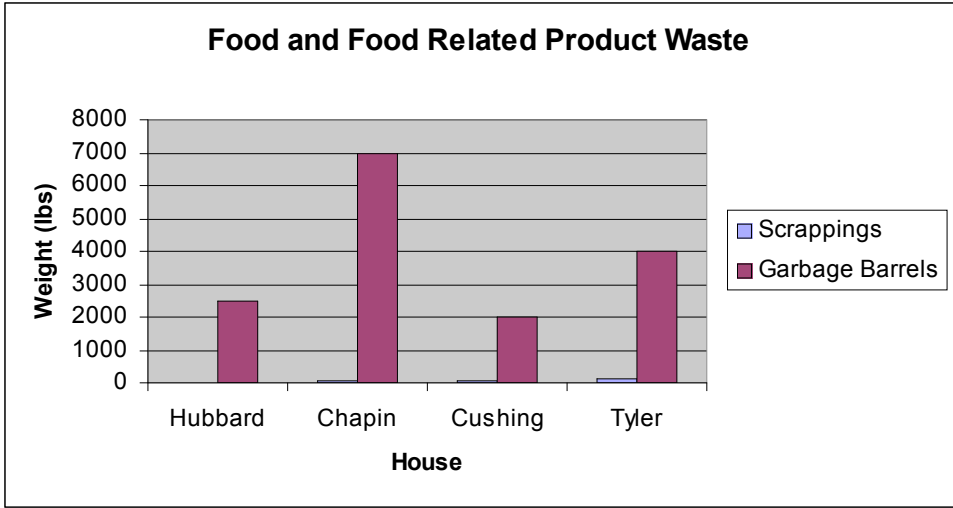


Figure 3. Averaged amounts of food waste and food related product waste in pounds generated by each house for one day. Food scrappings buckets and garbage barrels were measured separately.

Total Waste per Capita

Combining student averages and pounds of waste produced, we determined total waste produced per capita for each dining hall (Figure 4). It is evident that both Grab ‘N’ Go houses produce the greatest amount of waste per capita per day, with Chapin with 9.37 lbs and Hubbard with 5.61 lbs. The two traditional dining houses produces relatively less waste per capita per day, Tyler with 5.51 lbs and Cushing with 5.15 lbs.

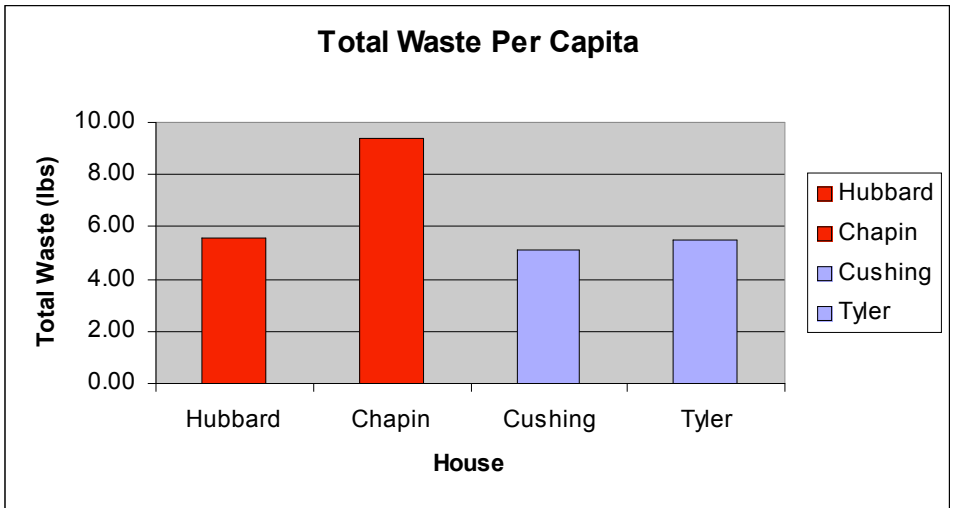


Figure 4. Total amount of waste in pounds generated per capita by each house for one day. Grab ‘N’ Go houses are in red and non-Grab ‘N’ Go houses in blue.

Discussion and Recommendations

The sustainability analysis conducted in this study on Smith College's "neighborhood model" indicates that Grab 'N' Go dining halls produce large quantities of food and food related product waste per capita compared to dining halls with traditional dining services. Based on this study, the new dining system needs improvement on its sustainability because the houses that were changed to Grab 'N' Go are the greatest polluters.

Our study also found that Chapin, a Grab 'N' Go dining hall, received the largest number of students per day during lunch. In addition, Chapin generated the most food and food related product waste. The high values observed for Chapin maybe due to its location in the center of campus. Students have easy access to the house and the food. Furthermore, lunch time is a meal that tends to be fast paced compared to breakfast or dinner. Students are rushed and in the rush do not take into consideration the amount of waste they are generating. Students cannot be expected to lead sustainable lives when they are "being educated in institutions that often spend their budgets and invest their endowments in the most irresponsible things" (Orr 1994).

This study encountered numerous limitations, thus, it is difficult to compare Smith's traditional dining system to the new "neighborhood model". The College may be cutting down on food related costs with the new system; especially because its produce provider is from the local Connecticut River Valley. However, it is spending unnecessary funds for Grab 'N' Go house, where it provides bottled water, individual plastic containers for food, in addition to carry-out paper bags and cups.

Based on the results of our study, we believe that the following recommendation will make the following suggestions:

No bottled water

Bottled water should not be made available to students during meals. Instead, students should be given a Nalgene water bottle that could be filled and re-used. An outrageous amount of bottled water is distributed daily to students, 3,600 bottles per day to be exact. Needless to say, the empty bottles and their packaging end up as garbage somewhere on campus. If Nalgene's were distributed in the beginning of the year to all incoming students and the rationale behind their use, the college can save money and reduce the amount of food related product waste.

No carry-out paper bags

Similar to bottled water, paper bags are unnecessary and eventually end up in garbage cans throughout campus. The bags are used only because they are made available. Students can carry food in their backpacks. Another possible substitution could be recyclable carry-out trays, which would also reduce the amount of individual plastic containers. The amount of food waste would also be reduced because students would have the flexibility to decide food portions.

Recycling bins

To have a sustainable dining system when recyclable products are available for use, recycling containers will need to be made accessible to students. The containers can be

positioned around Grab 'N' Go houses. More factors would need to be taken into consideration by the College prior to installing recycling containers.

Composting

Even if recycling bins were not distributed, having food waste and recyclable food related product waste would require that composting be re-implemented at Smith. Composting existed on campus but was removed because it seemed a burden to the system. If pursued as a sustainable method to manage food and food related product waste compost would be beneficial not only to the local community but also to the environment because it provides nutrients to the soil. There is vast amount of information on composting and installing them on or off-site depending on who haulers and users are (EPA 1998). Regardless of its location, the College and the natural environment would benefit from composting.

Future Research

This study had initially sought to compare Smith College's new dining system that is similar Mt. Holyoke's dining system. We were unsuccessful due to numerous limitations. Regardless, we stress that it is important to evaluate Smith to Mt. Holyoke because their dining system has been in practice for five years. This would not only evaluate Smith's dining system on sustainability but also to learn from others mistakes and hopefully achieve the goal of being a more sustainable institution.

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