

Great job overall

very nice survey questionnaire

well executed survey, nice complete descriptive analysis

would be useful to include a few carefully chosen graphs from appx's 5-11 in the body of the report

no use of confidence intervals in report? why bother with sample size calculation then??

Good report formatting, writing, etc.

-BJ

Carnegie Mellon University

CMU Dining: You Are What You Eat!

By: Qiaona Yu, Tianjiao Qi, Jisu Jennifer Kim, Sally Cheung, and Heewon Chi

Introduction

Dining has always been a topic that has received much attention at Carnegie Mellon University (CMU). Even though many changes ~~have been~~^{were} made last year in ~~efforts of~~^{to} improving the quality and the selection of foods, we would like to once again re-evaluate the satisfaction of students on the meal block system with the current dining options (David, D. (2009)). CMU requires first year students to be on a meal plan, so any changes made would be highly relevant for incoming freshmen each year (*Student Government Task Force: Analysis of Carnegie Mellon Dining Program*. (2009)).

According to the National Association of College and University Food Services, 21% of prospective college students strongly consider the school's dining program and amenities when deciding where to enroll (*College decisions and food services*. (2009)). National Association of College and University Food Services also provides past winners of campus dining awards ranging from Most Innovative Nutrition Program to Vegan Recipe Contest (*Past Winners - The National Association of College & University Food Services*. (2009)). Being able to constantly acquire feedback from students and implement innovative changes to CMU's dining options can motivate students to dine on campus more and appeal to incoming students.

Our survey sets out to assess the satisfaction of students on the CMU dining system. We want to obtain insight into the reasons for which people choose to dine at certain locations and what is important to student when it comes to food. Some of the variables our survey will measure include the correlation between major and dining location as departments are located in different campus buildings and this could be a factor as to where students choose to dine. Another variable is the correlation between ethnicity and dining location as CMU offers different types of food for students to choose from.

After fully assessing our responses and results, we hope to determine whether or not students are satisfied with the current dining options and vendors, what changes they want to see take place. We've already contacted Housing and Dining Services and they are highly enthusiastic in our results. We hope to present a detailed report for them and voice the opinions of our student body to bring about changes that can better satisfy the student community of CMU.

The results of our survey ^{indicate} that Carnegie Mellon University freshmen are overall fairly satisfied with the school dining system, but many changes can be implemented to better satisfy student's need of providing healthier options and more pasta options on campus. Student's favorite school vendor is Gingers because the food tastes good and the least favorite vendor is Asiana because the food tastes bad. There also seems to be no relationship between ethnicity and preferred dining location. Additionally, independent vendors are wanted on our campus to provide more dining options for students. ^{great}

Methods

Target Population, Sampling Frame, Sample Selection

The target population is CMU freshmen who are on the Meal Plan. The sampled

population will be a subset of the target population due to cases such as part-time students. There are not significant biases due to the difference. (since part-time students do not participate in the Meal Plan?)

The sampling frame is CMU freshmen who registered at HUB as a full-time student and bought the Meal Plan this semester. We used the list from the C-Book and designed to ask whether they are on the meal plan. If one says no to the question on the meal plan, no further questions are asked. This sampling frame is a subset of the target population, because we are sampling freshmen only as compared to all students at CMU. Since part of our target population is not in the sampled population, there might be some non-sampling errors. Also, if the response rate is low and the sample size is small, there might be some sampling errors.

In our survey, there are approximately 10,000 listings in C-Book, and the students' names are listed in alphabetical order as compared to being categorized by year. For these reasons, we chose to conduct a simple random sample (SRS). Since we are exploring the freshmen undergraduates' satisfaction with CMU dining, we can approach this survey more accurately by utilizing an SRS of the freshmen population. In our case, sampling without replacement is an appropriate and easy to conduct random sampling because as each person is sampled, he or she should be crossed off to avoid overlapping samples.

To generate our SRS, we first found out the starting and ending page numbers of the student listing in the C-Book. By indexing each page, we can randomly select a page per iteration. To do this, we used a random number generator. We also estimated the maximum number of names per page and indexed each other. By indexing each person per page, we can randomly select a person's index affect selecting a page. By repeating this process, we gathered the desired size of our random sample pairs – e.g. (page 1, index 1), (page 2, index 2),..., (page 400, index 400)

After generating the pairs of numbers needed, we flipped through the C-Book to locate the person. If the person selected was a freshmen, then that person would be counted in our sample, if not, they were excluded and we went onto the next pair. We went through this process until we reached our desired sample size.

From several calculations on the sample size (please refer to appendix 1 for sample size calculation), we decided that a sample size of 543 was the most reasonable one with a marginal error of 8% and an expected response rate of 25%.

Mode of Data Collection

For our mode of data collection, we choose to use Googledoc via email, and contacted 547 CMU freshmen. We collected a list of 547 email addresses for the undergraduate students who are on the Meal Plan from the C-Book and sent them the link to Googledoc form, which is an efficient mode of collecting data. Once the students received the emails, they would go to the link and respond.

To protect confidentiality and ensure students are of age, our survey was split into 2 forms. The first Googledoc form consisted of the online consent form (please refer to appendix 2 for Online Consent Form) of which students had to agree to participate and was above 18. The last question on this form was if the student was on the meal plan. If yes, the students were prompted with a second line to the actual questionnaire and if no, the students were done with the survey.

good

It's all over now so speak in the past tense.

170 students ~~have~~ responded to our survey starter, of which 140 were eligible and completed our survey. Hence, our ~~current~~ response rate is $140/547 = 25.6\%$. We sent three follow up emails (please refer to appendix 4 for contact letters) to the students to remind them to complete the survey. The first follow up email was sent on March 28th, the second was sent on April 6th, and the last follow up email was sent on April 14th.

Our survey is split into two parts, 7 demographic based question section and 13 dining question section. Some sample questions from our survey include, but were not limited to (please refer to appendix 3 for the complete questionnaire):

2. Gender *

- Male
- Female
- I prefer not to answer

(a) why the stars?

(b) if you are going to list the questions, you should talk about them a little bit

3. What Carnegie Mellon meal plan are you on currently? Check all that apply * If none, you are not eligible for this survey, thank you for your participation!

- Meal blocks
- DineX.
- Plaid Cash (primarily for food)

9. Which vendors do you like the most, for meals? * Choose up to 3

- Asiana (Newell-Simon Hall)
- Carnegie Mellon Cafe (Resnik House)
- City Grill (University Center)
- Downtown Deli (University Center)
- Entropy (University Center)
- Evgestos! (University Center)
- The Exchange/Ginger's (Tepper)
- Ginger's Express (Baker)
- Kosher Korner (University Center)
- La Prima (Wean)
- The Maggie Murph Cafe (Hunt Library)
- Mitchell's Mainstreet Market (Newell-Simon Hall)
- Quik Picks (University Center)
- Schatz (University Center)
- Si Senior (University Center)
- Skibo Coffeehouse (University Center)
- Souper Soups (University Center)
- Spice it up Grill (Resnik House)
- Spinning Salads (University Center)
- Stephanie's (Mellon Institute)
- Stir Crazy (University Center)
- Sushi Too (Resnik House)
- Take Comfort (Resnik House)

- Tartan's Pavilion (Resnik House)
- Taste of India (Resnik House)
- Tazza D'oro (Gates Hillman Center)
- Totally Juiced (University Center)
- The Underground (Morewood)
- The Zebra Lounge (CFA)
- AVI Vending (Wean/multiple locations)

11. How would you rate the CMU dining services when it comes to:

	Very Poor	Poor	Neutral	Good	Very Good
The food and drinks offered suit my taste/need					
The menu variety					
Prices in general					
The quality of the food					
Healthy choice options					
The waiting time					
Cleanliness					
Staff friendliness					
Availability/Hours of Operation					

Problems Encountered

During the sample selection, we generated a set of random numbers ^{with the statistical software package} through R. We used the random numbers to create a set of sample pairs -- i.e. page number and row number. However because there were duplicate pairs, it was necessary to sort out the data through Microsoft Excel and eliminate the duplicates.

Another problem that we encountered was that there was a small drop-out rate during the respondent's transition from the starter part to the questionnaire part of the survey. Since it was necessary that we have two parts, in which first part filters out those who do not satisfy the preliminary questions (meal plan enrollment, age limit, consent form, agreement to participate), we considered the drop-out as a refusal to respond. ✓

ok good

Post Survey Processing

Recoding

Upon the completion of data collection, we went through the raw survey data to recode our categorical data. We had many questions that involved rating the services provided by the

CMU Dining services, on a scale from “*Very Poor*” to “*Very Good*”. The “*Very Poor*” category was recoded as “1”, “*Neutral*” was recoded as “3”, and “*Very Good*” was recoded as “5”. Some other questions ask respondents to choose “*Yes*” or “*No*”, therefore, “*Yes*” was recoded as “1” and “*No*” was recoded as “0”.

Imputation

We did not design our survey to allow for partial responses (aside from the last question, see Appendix 3, which was open-ended), therefore we do not have to impute any item-nonresponses.

Weighting

From the demographics of our sample, we decided to impose weights based on gender on the recoded data (please refer to Appendix 5). Weights were calculated using the demographics information of CMU Freshmen in the CMU Fact Book (please refer to Appendix 5 for detailed calculations). We decided that we did not need to weight based on college or dormitory because our sample proportion for college was very similar to the population proportion for college, and that it is natural that certain dorms would have more respondents than others because there are freshmen dorms (Mudge House) and almost non-freshmen dorms (Resnik and West Wing). There were two responses that were not usable ~~in some cases~~ because respondents preferred not to disclose both their gender and ethnicity information, so we could not include these two respondents in some of our analysis. The weight calculations are shown below:

	Population Proportion	Sample Proportion	Weights
Male	0.5706	0.50	1.1412
Female	0.4294	0.50	0.8588

Results

Student’s satisfaction with school dining vendor

In order to determine whether or not CMU freshmen are satisfied with the current dining options and vendors, we asked students to rank their satisfaction on overall dining services, the taste of the food, the menu variety, the price, the quality of the food, the healthy choice options, the waiting time, cleanliness, staff friendliness, and the availability/hours of operation. We coded the rankings with numbers (1=very poor; 2=poor; 3=neutral; 4=good; 5=very good), and studied the distributions of them.

As shown in Figure 1 (please refer to appendix 6), more than 55% of the subjects ranked the overall CMU dining services as ‘Neutral’, and another 30% chose ‘Satisfied’. Only about 2% answered ‘Very Satisfied’. The mean is somewhere between neutral and satisfied. For the individual aspects of CMU dining services, students seem to be quite satisfied with the taste of food, the waiting time, cleanliness, staff friendliness, and the availability/hours of operation, given that ‘Good’ is the most common ranking for all these distributions (please refer to Appendix 6: Figure 2 – 6). About 40% people chose ‘Neutral’ for the menu variety, and its distribution is slightly skewed to the left (please refer to Appendix 6: Figure 7). About 50% students answered ‘Neutral’ for the quality of food, and its distribution is pretty symmetric (please refer to Appendix 6: Figure 8). Students seem to be unsatisfied with healthy choice options and the prices of food, given that

more than half of them answered 'Poor' or 'Very Poor' for these questions (please refer to Appendix 6: Figure 9 & 10).

We were also interested in studying how important it is that the school vendors provide healthy/organic options, and whether there is a gender effect. It is hypothesized that females tend to think these options more important. We asked students to rank the importance from 1 to 5 with 1 being 'Not important at all' and 5 being 'Very Important'. For healthy options, the gender effect is really obvious as all females chose 3 or higher and more than half of them chose 5. For males, the healthy options are also important to them, given that about 60% ranked 4 or 5 (please refer to Appendix 6: Figure 11). As for organic options, there is a great gender effect as well. Most females think organic options are important while most males think they are not that important (please refer to Appendix 6: Figure 12).

Relationship between student's major and dining location

When looking at the relationship between student's major and dining location, we took two questions into consideration. The first question used was a demographic question: "What is your college?" and the second question we used was "Which vendors do you like the most, for meals?" To look at the relationship between college and preferred dining locations, we took our data and looked at each major separately and use percentages to calculate the preferred dining location since the sample size of each strata differed. Percentages allowed us to compare across colleges on the same scale.

Six Individual bar graphs were used to visualize the relationship between dining locations and majors (please refer to Appendix 7 for individual graphs). A summary of the results is as follows:

Ranking	CIT	CFA	HSS	MCS	SCS	TSB
1 st	Gingers	Gingers	Gingers	Gingers	Taste of India	Gingers
2 nd	Schatz	Take Comfort, Entropy	Take Comfort, Schatz, Carnegie Mellon Café	Taste of India, Spice it up Grill, Si Senor	Skibo, Schatz, Gingers	Entropy
3 rd	Skibo	Zebra Lounge	Entropy	Skibo	Underground, Tazza D'oro, Spice it up Grill, Carnegie Mellon Café	Skibo

As seen in the summary above, the favorite dining location was The Exchange/Ginger's located in Tepper School of Business regardless of the student's major. 5 out of 6 schools ranked this location as their 1st preferred dining vendor while 1 of the school ranked it as 2nd. Other locations that appeared to be in the top three dining locations of the schools included Skibo, Schatz, Take comfort and Carnegie Mellon Café.

We also looked at the relationship between preferred dining location and proximity/convenience of the dining vendor. The primary location for CIT is Hamerschlag hall, CFA is College of Fine Arts Building, H&SS Students is Baker Hall, MCS is Doherty Hal, SCS is Gates Center and Wean Hall, TSB is Tepper / Posner Hall. The ~~locations of the~~ preferred dining locations are not conveniently ~~located~~ for all the students, except Gingers and Zebra Lounge for CFA students and Gingers for TSB students. Therefore, there seems to be no relationship between student's major and preferred dining location.

Reasons for favorite and least favorite vendors

From the previous section on relationship between major and dining location, we see that student's favorite vendor was Ginger's. Now we are trying to look into the reasons for why students like the top vendors. In our survey, the particular question that deals with this relationship is "Why do you like /dislike this vendor?" To summarize our findings, we found that 80% of students value the taste of foods the most (please refer to appendix 8). Various options and convenience in location had the second highest rankings of about 50% each. The price of food had the lowest percentages approximately 5%, and it is interesting to see that students seem to find food at CMU as reasonably priced. When it comes to the other reasons which are mostly related to the dining environments, these reasons show similar rates of 20 -30% and we can see that students do not care hugely on location, staff's friendliness, opening hours and cooking time. Another interesting note is that eating healthy does not take a large part in student's choice of favorite vendors at CMU.

From the survey, students' least favorite vendor was Asiana, and from our analysis, the taste of the food is the main reason, approximately 63%, for why students dislike the vendor (please refer to appendix 8). When we looked at student's favorite reasons, the two second highest ranking reasons various options and location. Except for the highest and the second highest reasons, most of the other reasons showed similar rates. However, for student's least favorite vendors, nutrition issue is found to be the only second highest reason of 47.5 percent. Unlike the low rates of reasons in the favorite vendor, there are distinct rate differences in the least favorite graph. For example, various options and food cooking time take quite a large proportion among the reasons of the least favorite vendors even though they are not the most and the second most highest reasons. In addition, dining environments such as staffs' unfriendliness, location, and price do not seem to affect much in choosing least favorite vendors at CMU because most of these rates are less than 20 percent. Therefore, we can see that students take less consideration in dining environment when they choose their least favorite vendors.

Relationship between ethnicity and food types on campus

Our expectation was to see a different trend of preferred food types by different ethnic groups. For instance, Asians may prefer Asian food. In order to find out whether there is such a trend, we recoded the data. We were given with a raw dataset that lists individual respondents, their ethnicity, and preferred vendor (s). Since respondents were able to select up to all vendors, it was not feasible to compare the proportions by ethnicities or food types.

First the vendors were categorized by different cuisines and types – i.e. Western, Indian, Beverage, etc. Vendors that do not belong to any of the categories, such as Entropy, AVI Vending (Wean/multiple locations) and Evgestos! (University Center), were placed in the Alternative group.

As a result, total numbers of vendors varied by food type. Next the ethnicities were recoded so that they also consist of biracial demographics and those who preferred not to answer. After categorizing and recoding, we wanted to compare the counts per food type per ethnicity. Hence we divided every value by the grand total count (please refer to Appendix 9).

We found that there is no particular trend that varied by ethnicities. The general trend regardless of ethnicity was that everyone preferred Western food the most and Alternative the second. The rest had no certain trend. In conclusion, ethnicity does not seem to depend on respondents' preference in food types.

Open-ended questions and student opinions

Out of the 140 responses we've received, 97 respondents answered the last, open-ended question of our survey. 24% of our respondents expressed an interest in Italian food, pasta in particular, to be incorporated into our dining menu (please refer to Appendix 10). While many chose Italian food, many also chose to have healthier options (including low fat, low sodium, less grease). Lots of students hope to see more fruits and vegetables within their meal plan options.

Aside from providing specific menu items, many students also had suggestions as to hours of operations and installing comment/recipe boxes around campus. Many students who work long hours on campus do not have any food vendors to choose from besides Maggie Murph Café to purchase food from. Students have also suggested that we modify our survey such that they can comment on each food vendor; students do not know of (or too lazy to go to) the comment boxes located in the Housing and Dining Offices and so they feel that they have a lot of suggestions but nowhere to express their opinions.

Suggestions for Dining Services

Based on the responses (please refer to Appendix 11), we can see that the majority of students are not satisfied with the current dining system. 67% of men and 40% women would like to see independent vendors that would provide food with more standardized quality and quantity. A smaller portion of men (45%) and women (37%) would like to have a buffet style cafeteria in resident halls, possibly primarily because Schatz is the only dining option that resembles a cafeteria, and that it would be convenient as they would be located in resident halls. Only a small proportion of men (16%) think that the dining system is good the way it is; more women (30%) actually think the dining system is good the way it is. Respondents also had the option of filling in "other" for this question. Of those who filled in "Other", majority of students (both male and female) requested for healthier options and for a more flexible meal block system. Many students have expressed their discontent over the rigid meal block system, hoping to have more local vendors (trucks and Giant Eagle) accept DineX or meal blocks.

The majority of both men and women (roughly 75% altogether) would like to see nutritional information on menu boards from campus vendors. It reflects students' concern over how healthy their daily meals are, and students will have the options of keeping track of their dietary intake.

Discussion

To summarize, most students (55%) ranked 'Neutral' for their overall satisfaction towards CMU Dining Services. They think that the Dining Services has done a great job in terms of satisfying student needs and taste, controlling the waiting time, maintaining the cleanliness and staff friendliness, and having reasonable hours of operations. Most students feel neutral about the menu variety and quality of food, but further questioning of the students expressed their hope for better, higher quality food in general. The most problematic appears to be the prices and the healthy options; majority ranked them 'Poor' or 'Very Poor'.

As we've investigated further, we found that students think it's very important that campus vendors offer healthy options, especially women think so. In terms of organic options, a greater gender effect is present as most women find it important and men think it's not important.

We explored potential relationships between college and dining locations and we found no correlation between those two variables; most colleges' favorite dining location was Ginger's despite their home college location. It was found that students liked Ginger's primarily because of the taste of the food, convenience and the various options that the vendor offers. We also found that students' least favorite vendor was Asiana; students dislike Asiana because the food did not taste good and that the food was not healthy.

We expected to see a correlation between students' ethnicity and food types on campus (i.e. Asian students would prefer Asian food vendors such as Asiana). However, we did not find a relationship between these variables. Western food type was the most popular among all students, and we suspect that it is mainly due to the large number of western food vendors on campus.

As mentioned previously, a large majority of students, both men and women, would like to see nutritional information displayed on menu boards. Students would like to have both independent vendors (both national and local) to become campus vendors, and to have buffet style cafeterias as many other U.S. college campuses do.

As suggested by the open-ended question responses, students would like to have a pasta bar installed on campus. Students would like to have healthier options in general so Dining Services should definitely cooperate with the nutritionist at Student Health Services to create a much more wholesome dining menu.

We have found some interesting new suggestions by the sample of freshmen that we've surveyed. The survey targeted freshmen primarily because freshmen are only exposed to the newly improved dining services provided by CulinArt and we'd like to know what they think about the new services since they have not experienced the old one and that they are the future of CMU.

The survey was very straight-forward in terms of questioning students. Students were given many options to choose, pick and rank, and students provided many helpful suggestions.

Surprising, expected results

There is no correlation between college location and location of frequently visited vendors. Students who frequently dine on campus (at least once a day, including weekends) rank variety and availability lower than students who dine less frequent.

We are surprised by how passionate some students were about our open ended questions -- there were long paragraphs regarding what they think CMU Dining Services should improve on, that wasn't covered elsewhere in our survey. Aside from suggestions to menu variety and quality of food, many people suggested to have somewhere that they can voice their opinions about how to improve.

it would be valuable to include these comments in an appx.

Strengths and weaknesses and recommendations

Our project covered many topics in a relative short and simple survey. This ensured the completion rate to be higher and for us to address the dining problems on campus. By presenting this project to CMU Housing and Dining services, we believe we will be giving Dining Services helpful suggestions since many students pointed out interesting and different advice that Dining Services could consider. Also, our survey was set up so that students were required to complete the entire survey. This reduced the chances of imputation, therefore in our project, imputation was not required.

A recommendation that we have is including a couple open-ended questions. Students were very enthusiastic with providing helpful responses ~~but the problem is that coding the responses would be difficult, but~~ these answers are very useful.

and although

Take home Messages

In conclusion, the take-home messages from our particular project is that students are generally not satisfied with the school dining system and many changes can be made to better satisfy the needs of the students:

1. Students want healthier options in general for meal blocks. This means having more fruits and vegetable options as the side menu on the meal block, instead of requiring a soda with your meal. Students should also not have to pay a lot to buy fruits on campus, since they are an important part of students' diets.
2. Students feel very strongly about implementing a fresh pasta bar where students can mix-and-match pasta and sauce, and possibly have healthy vegetable toppings (among other toppings). Preferably the pasta would be healthy (whole wheat), and that sauces and toppings are made with less sodium and less oil.

3. Students love the staff that work on campus and think the staff keeps the dining environment very clean and enjoyable. However, students think that prices are too high for what they would like to pay, especially since the meal plan is required.
4. Students with restricted diets feel very limited when they eat on campus.
5. Students would like to see nutritional information and calorie counts on menu boards.
6. The hours of availability for certain campus vendors can be adjusted to have longer hours, not just during exam week.
7. More flexibility within the meal plan: when students use their blocks and where they can use their blocks or DineX (students would like trucks and Giant Eagle to take DineX).
8. Most students want to see independent vendors on campus because they offer more standardized food where quality is guaranteed. Lots of other students also want to have buffet style cafeterias in resident halls. Students feel that Schatz is the only place that resembles a cafeteria and they want more cafeterias that are close to where they live.
9. Dining Services should consult the nutritionist at the Student Health Services to develop a well-rounded meal block, where they can choose plenty vegetables and fruits as side dishes, and have other options for drinks rather than soda.

References

College decisions and food services. (2009). Retrieved February 25, 2010 from National Association of College and University Food Services, National Association of College and University Food Services: http://www.nacufs.org/files/public/pdf/technomic_surveys/nacufs_feb10.pdf.

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Appendix

Appendix 1: Sample Size Calculation

Calculate SRS with replacement and apply correction for SRS without replacement.

$$n_0 \geq \frac{(Z)^2(SD)^2}{(ME)^2} = \frac{(1.96)^2(0.5)^2}{(0.08)^2} = 150.06$$

$$n \geq \frac{Nn_0}{N + n_0} = \frac{(1400)(150.06)}{1400 + 150.06} = 135.53$$

Expected response rate of 25%:

$$\frac{n}{0.25} = \frac{135.53}{0.25} = 542.12$$

Appendix 2: Starter Part & Consent Statement

Dining Survey Starter

Please fill out this survey to see if you are eligible for our survey. Once you've submitted your answers below, you will be given more instructions. Thank you!

Note: All information given in these surveys will be kept confidential. Your Andrew ID will be used to make sure we know we've contacted you and you have filled out our survey. Please fill out your Andrew ID so that we don't spam you with more emails!

Online Consent

This survey is part of a research study conducted by Joyner Yu at Carnegie Mellon University.

The purpose of the research is to assess CMU's current dining system. Even though many changes have already taken place in the past year improving the quality and the selection of foods, we would like to conduct a survey to investigate how satisfied students who are on the meal block system now are with the current dining options. What changes do students still want to see in the current dining system and what do students like about the current dining system. Being able to constantly improve dining services on campus can motivate students to eat at certain places more often.

Procedures

Participants will be contacted through Andrew Mail and an external survey link will be provided. Participants should click on the link and will be redirected to Googledocs. This survey consists of 28 questions and should take no more than 10 minutes in total.

Participant Requirements

Participation in this study is limited to individuals age 18 and older.

Risks

The risks and discomfort associated with participation in this study are no greater than those ordinarily encountered in daily life or during other online activities.

Benefits

There may be no personal benefit from your participation in the study but the knowledge received may be of value to humanity. Suggestions are highly recommended as our assessments will be handed out to the Dining Services of CMU and improvements could be made accordingly to improve the overall Dining Services of Carnegie Mellon University.

Compensation & Costs

There is no compensation for participation in this study. There will be no cost to you if you participate in this study.

Confidentiality

By participating in this research, you understand and agree that Carnegie Mellon may be required to disclose your consent form, data and other personally identifiable information as required by law, regulation, subpoena or court order. Otherwise, your confidentiality will be maintained in the following manner:

Your data and consent form will be kept separate. Your consent form will be stored in a locked location on Carnegie Mellon property and will not be disclosed to third parties. By participating, you understand and agree that the data and information gathered during this study may be used by Carnegie Mellon and published and/or disclosed by Carnegie Mellon to others outside of Carnegie Mellon. However, your name, address, contact information and other direct personal identifiers in your consent form will not be mentioned in any such publication or dissemination of the research data and/or results by Carnegie Mellon.

Right to Ask Questions & Contact Information

If you have any questions about this study, you should feel free to ask them by contacting the Principal Investigator now at 917-459-6816, and address: SMC 5246, 5032 Forbes Ave, Pittsburgh, PA 15213. If you have questions later, desire additional information, or wish to withdraw your participation please contact the Principle Investigator by mail, phone or e-mail in accordance with the contact information listed above.

If you have questions pertaining to your rights as a research participant; or to report objections to this study, you should contact Brian Junker at Carnegie Mellon University. Email:

brain@stat.cmu.edu . Phone: 412-268-2718.



This research project is exempt from Carnegie Mellon University Institutional Review Board (IRB) review, since it is being undertaken as a course requirement.

Voluntary Participation

Your participation in this research is voluntary. You may discontinue participation at any time during the research activity.

* Required

I am 18 or older. *

- Yes
- No

would be useful to include counts and percents of responses in each category with the survey questions here.

I have read and understand the information given in the consent form above. *

- Yes
- No

I want to participate in this research and continue with the survey. *

- Yes
- No

Are you on a CMU meal plan (including meal blocks, DineX, Plaid Cash for food)? *

- Yes
- No

What is your Andrew ID? * This is to track response rates, please fill this in so that we don't ask you over and over again to fill out our survey!

Appendix 3: Full Questionnaire

Dining Services Survey

Please answer these questions as carefully and accurately as possible.

If you are NOT on any form of the CMU dining plan (meal blocks, DineX, plaidcash for food), you are not eligible for this survey.

Thank you for your contribution!

* Required

2. Gender *

- Male
- Female
- I prefer not to answer

3. What Carnegie Mellon meal plan are you on currently? Check all that apply * If none, you are not eligible for this survey, thank you for your participation!

- Meal blocks

- DineX.
- Plaid Cash (primarily for food)

4. What college are you in? * Check all that apply

- Tepper School of Business
- Mellon College of Science
- School of Computer Science
- Humanities & Social Studies
- College of Fine Art
- Carnegie Institute Technology

5. Do you live in school housing? *

- Yes
- No

6. If yes, where? *

- Boss House
- Doherty Apartments
- Donner House
- Fairfax Apartment
- Hamerschlag House
- Henderson House
- London Terrace House
- Margret Morrison Apartments
- McGill House
- Morewood E-Tower
- Morewood Garden
- Mudge House
- Neville Apartments
- Stever House
- Resnik House
- Roselawn House
- Scobell House
- Shady Oaks Apartments
- Shirley Apartments
- Spirit House
- Tech House
- Veronica Apartments
- Webster Hall
- Welch House
- West Wing
- Woodlawn Apartments
- Other

7. What is your nationality/Ethnicity? * Check all that apply

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White
- I prefer not to answer
- Other:

8. I regularly have...on campus. * check all that apply

- Breakfast
- Lunch
- Brunch
- Mid-morning/mid-afternoon snacks
- Dinner
- Late-night

9. How often do you dine at one of the on-campus food vendors? * choose one

- At least once every day of the week, including weekends
- At least once every day, but just weekdays
- Less than 5 times a week
- Never.

10. How satisfied, in general, were you with your meals/snacks? *

	1	2	3	4	5	
Very Unsatisfied						Very Satisfied

11. How would you rate the CMU dining services when it comes to: *

	Very Poor	Poor	Neutral	Good	Very Good
The food and drinks offered suit my taste/need					
The menu variety					
Prices in general					
The quality of the food					
Healthy choice options					
The waiting time					

Cleanliness					
Staff friendliness					
Availability/Hours of Operation					

12. Which vendors do you like the most, for meals? * Choose up to 3

- Asiana (Newell-Simon Hall)
- Carnegie Mellon Cafe (Resnik House)
- City Grill (University Center)
- Downtown Deli (University Center)
- Entropy (University Center)
- Evgestos! (University Center)
- The Exchange/Ginger's (Tepper)
- Ginger's Express (Baker)
- Kosher Korner (University Center)
- La Prima (Wean)
- The Maggie Murph Cafe (Hunt Library)
- Mitchell's Mainstreet Market (Newell-Simon Hall)
- Quik Picks (University Center)
- Schatz (University Center)
- Si Senor (University Center)
- Skibo Coffeehouse (University Center)
- Souper Soups (University Center)
- Spice it up Grill (Resnik House)
- Spinning Salads (University Center)
- Stephanie's (Mellon Institute)
- Stir Crazy (University Center)
- Sushi Too (Resnik House)
- Take Comfort (Resnik House)
- Tartan's Pavilion (Resnik House)
- Taste of India (Resnik House)
- Tazza D'oro (Gates Hillman Center)
- Totally Juiced (University Center)
- The Underground (Morewood)
- The Zebra Lounge (CFA)
- AVI Vending (Wean/multiple locations)

13. Why do you like these vendors? * Choose up to 2

- The food tastes good.
- It's fast
- It's convenient location wise
- It has a lot of options.

- It's healthy
- The staff are friendly.
- The dining environment is good.
- They are always open
- They are cheap/reasonably priced.

14. Which vendors do you like the least, for meals? * Choose up to 3

- Asiana (Newell-Simon Hall)
- Carnegie Mellon Cafe (Resnik House)
- City Grill (University Center)
- Downtown Deli (University Center)
- Entropy (University Center)
- Evgestos! (University Center)
- The Exchange/Ginger's (Tepper)
- Ginger's Express (Baker)
- Kosher Korner (University Center)
- La Prima (Wean)
- The Maggie Murph Cafe (Hunt Library)
- Mitchell's Mainstreet Market (Newell-Simon Hall)
- Quik Picks (University Center)
- Schatz (University Center)
- Si Senor (University Center)
- Skibo Coffeehouse (University Center)
- Souper Soups (University Center)
- Spice it up Grill (Resnik House)
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- Tartan's Pavilion (Resnik House)
- Taste of India (Resnik House)
- Tazza D'oro (Gates Hillman Center)
- Totally Juiced (University Center)
- The Underground (Morewood)
- The Zebra Lounge (CFA)
- AVI Vending (Wean/multiple locations)

15. Why do you dislike these vendors? * Choose up to 2

- The food tastes bad.
- It takes me a long time to get my food.
- It's in a bad location; I never go to some of those locations.
- Not enough options.
- It's not healthy

- The staff are unfriendly.
- The dining environment is not good.
- It's expensive
- They are not open when I want food.

16. Which of these dining services would you like to see at CMU? *

- Independent vendors, i.e. McDonald's, KFC, Chipotle, Wendy's, etc
- A cafeteria, buffet style, in most resident halls.
- It's good the way it is.
- Other:

17. How important is it to you that school vendors provide healthy options? *

	1	2	3	4	5	
Not important at all.						Very important

18. How important is it to you that school vendors offer organic options? *

	1	2	3	4	5	
Not important at all.						Very important.

19. Would you like to see nutritional info and calorie counts on the menu boards? *

- Yes
- No

20. If you can add one type of food to the CMU dining service's menu, what would it be? It can be as specific as you like, or just a general genre of food.

Appendix 4: Contact Letters

FIRST EMAIL SUBJECT LINE: You are what you eat!

Dear PARTICIPANT,

If you care about what you eat on campus every day, then you should take this short survey for a student project! We are evaluating student satisfaction with the current dining services at CMU, and your results will be very valuable to us for suggesting improvements to Housing and Dining Services that will benefit YOU!

Here is the link to our survey:

<https://spreadsheets.google.com/viewform?formkey=dHFfTURMcOpsaFg5a08teIFFcnFLa2c6MA>

Please take a few minutes to fill out this survey!! The more responses we get, the more opinions we'll be able to voice! Thank you very much for your participation!

Sincerely,

Tianjiao Qi
Sally Cheung
Jisu Kim
Jenny Chi
Joyner Qiaona Yu

FOLLOWUP EMAIL:

Dear PARTICIPANT,

We've noticed that you have not filled out our dining service survey! It would be greatly appreciated if you could take our survey before DATE, so that we can let the Dining Services know what YOU think!

It will only take a few minutes to fill out this survey, so please please take a moment to do this!

Here's the link:

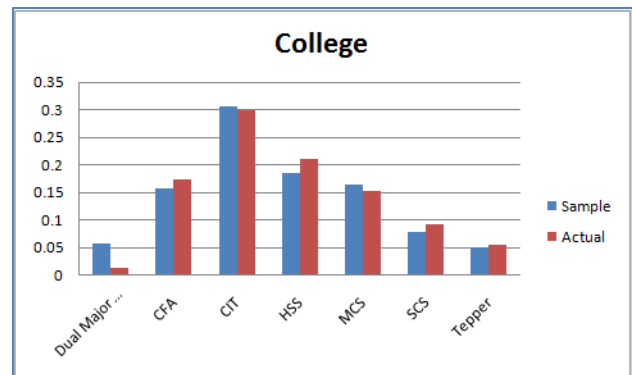
<https://spreadsheets.google.com/viewform?formkey=dHFfTURMcOpsaFg5a08telFFcnFLa2c6MA>

Thank you for your participation!

Sincerely,

Tianjiao Qi
Sally Cheung
Jisu Kim
Jenny Chi
Joyner Qiaona Yu

Appendix 5: Post Stratification



WEIGHT CALCULATIONS:

$$\text{Weight}_M = \frac{\text{Population Proportion}}{\text{Sample Proportion}} = \frac{812/1432}{69/138} = 1.1412$$

$$\text{Weight}_F = \frac{\text{Population Proportion}}{\text{Sample Proportion}} = \frac{611/1432}{69/138} = 0.8588$$

Appendix 6: Student Satisfaction

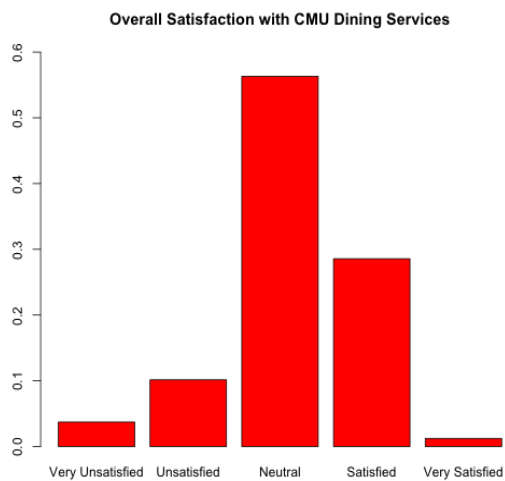


Figure 1

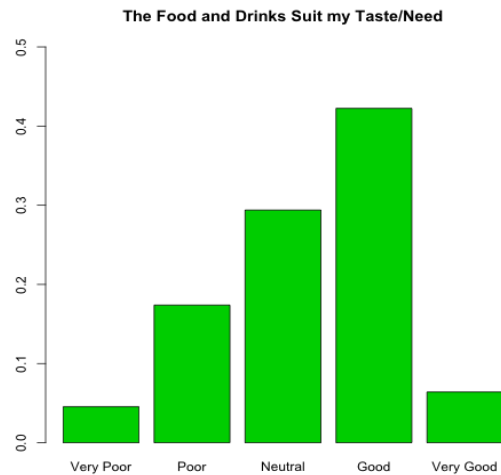


Figure 2

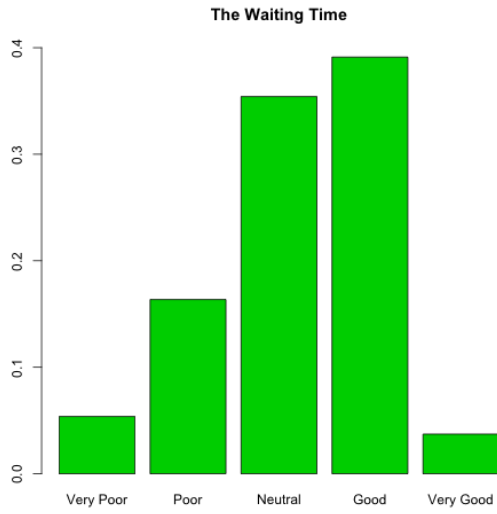


Figure 3

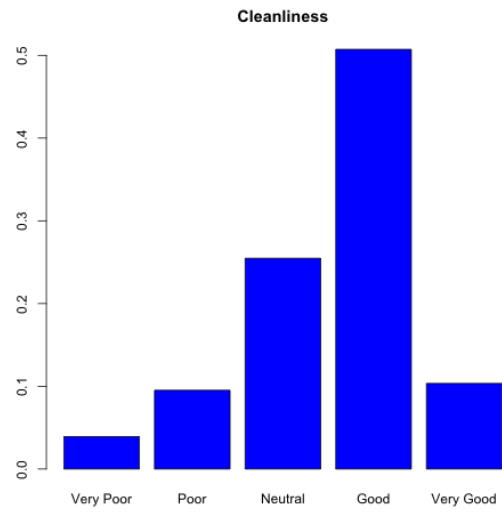


Figure 4

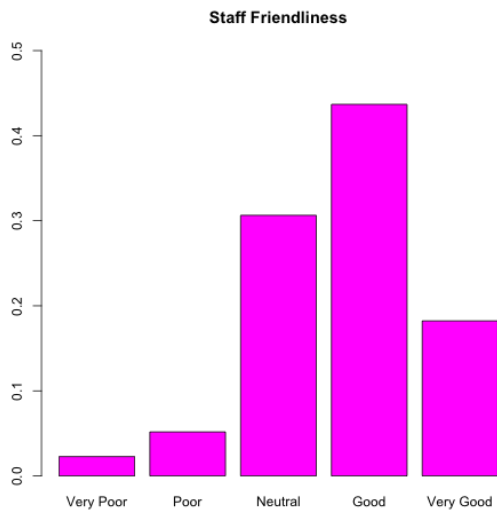


Figure 5

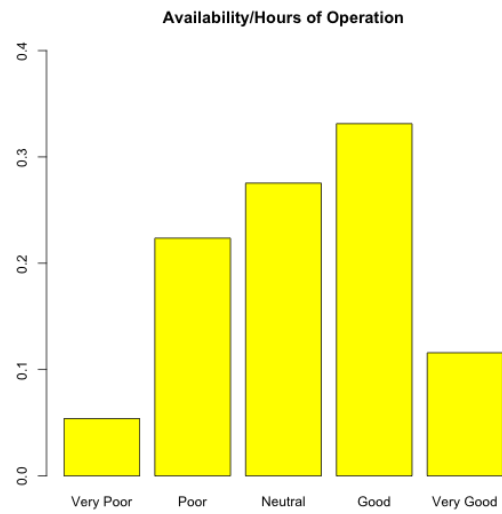


Figure 6

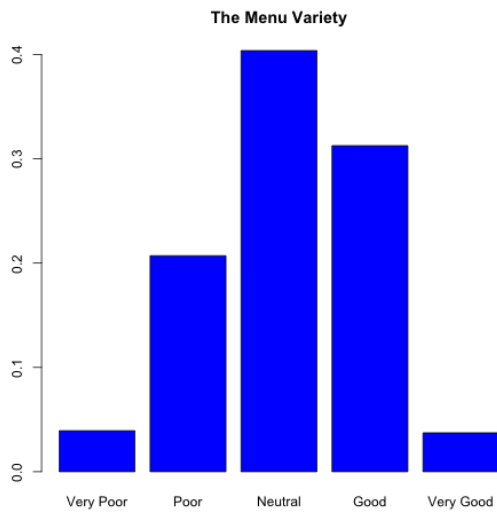


Figure 7

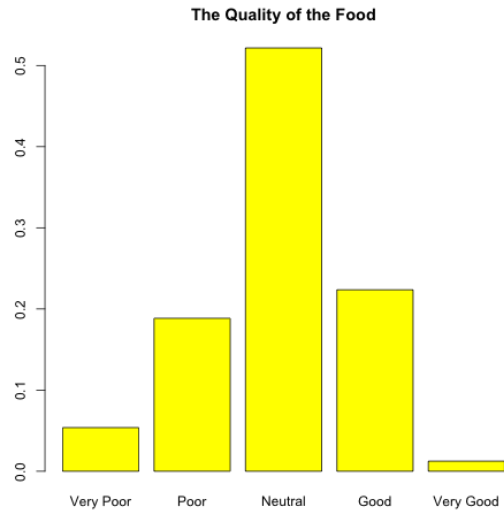


Figure 8

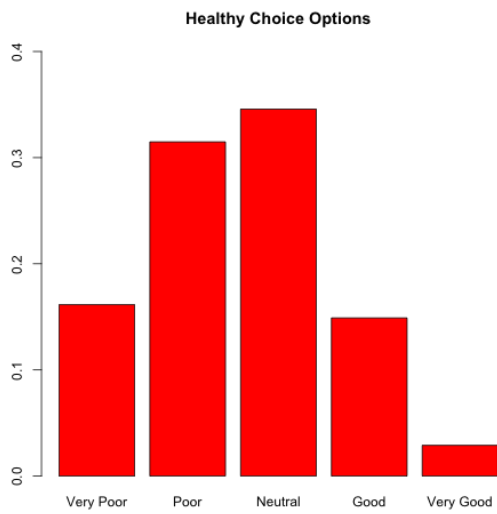


Figure 9



Figure 10

How important is it that school vendors provide healthy options?

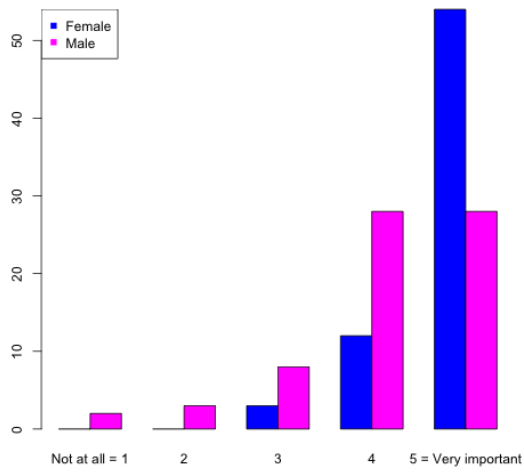


Figure 11

How important is it that school vendors offer organic options?

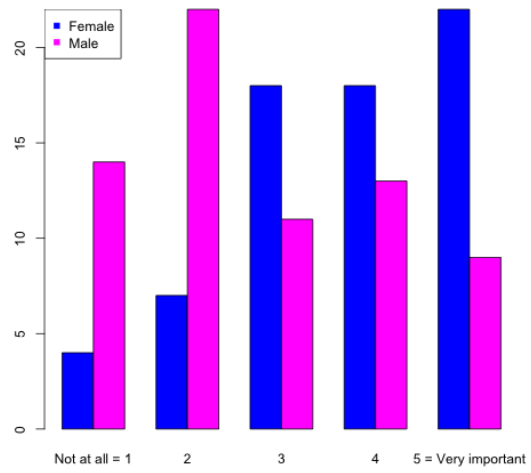
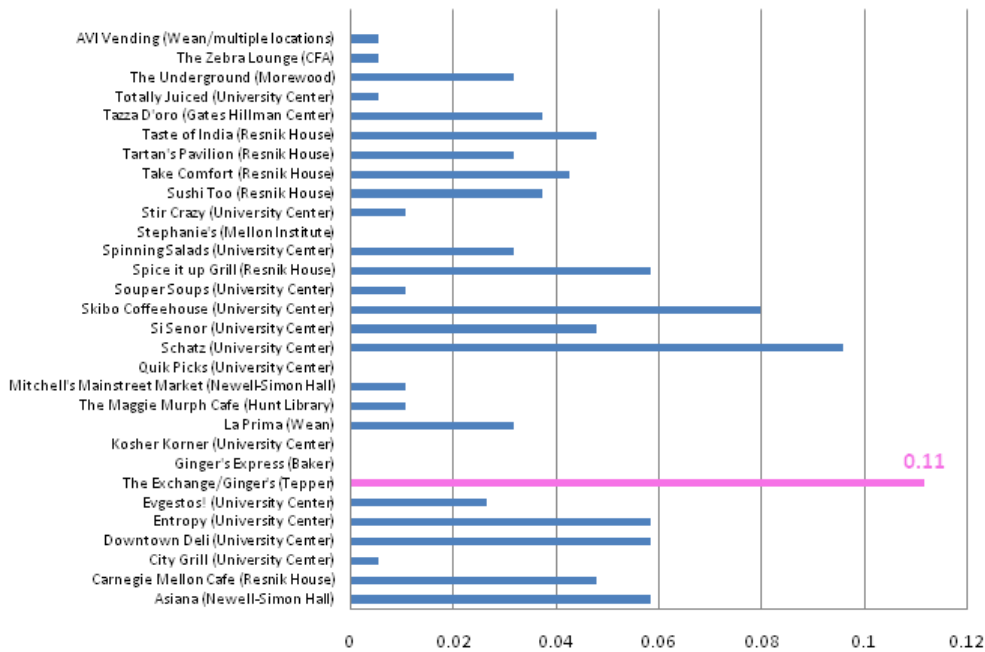


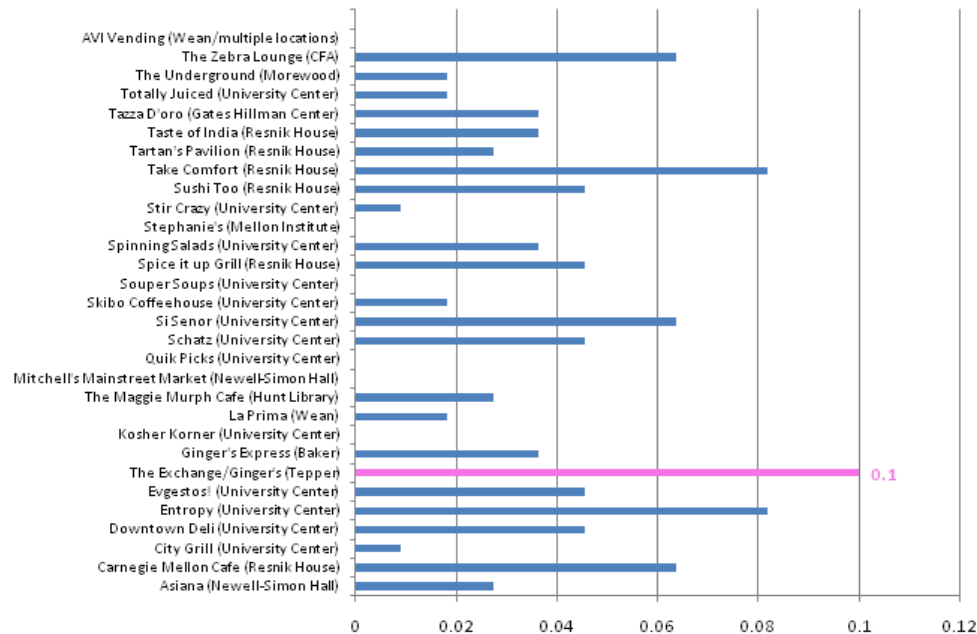
Figure 12

Appendix 7: Major and Location

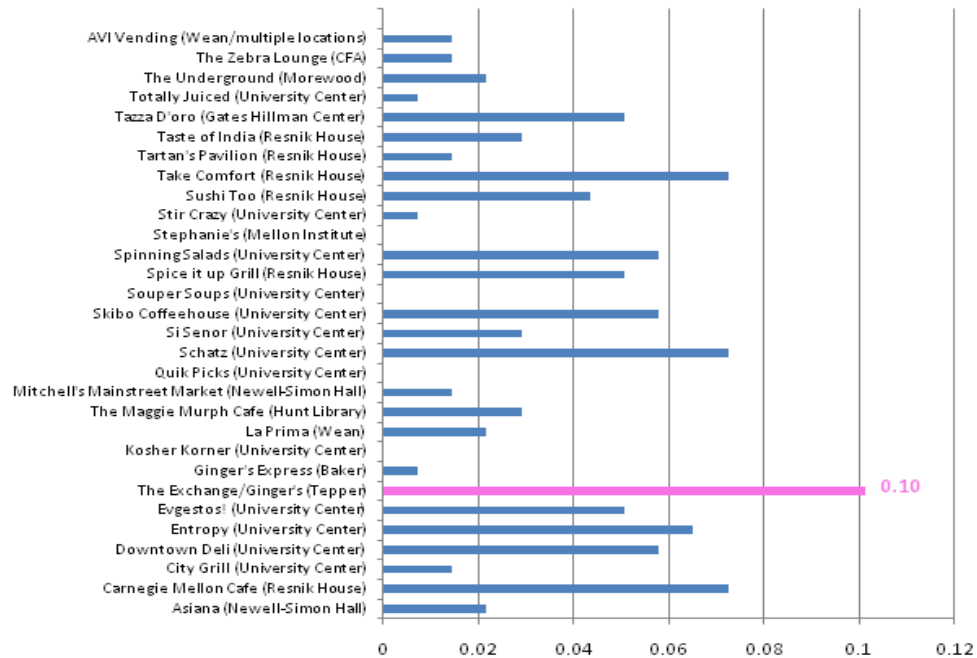
CIT Dining Locations



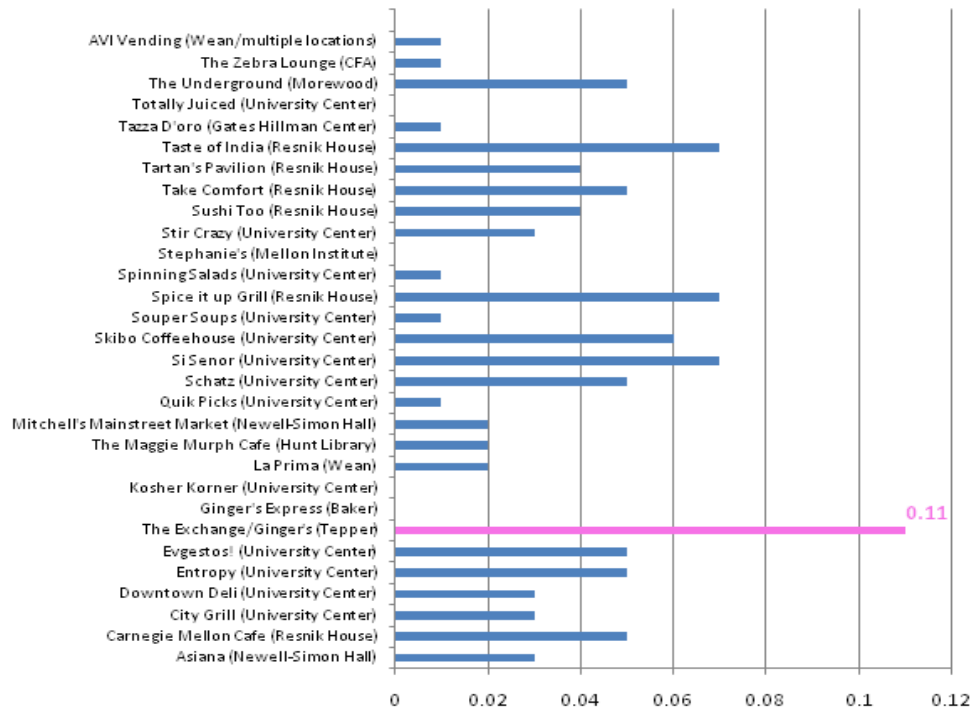
CFA Dining Locations



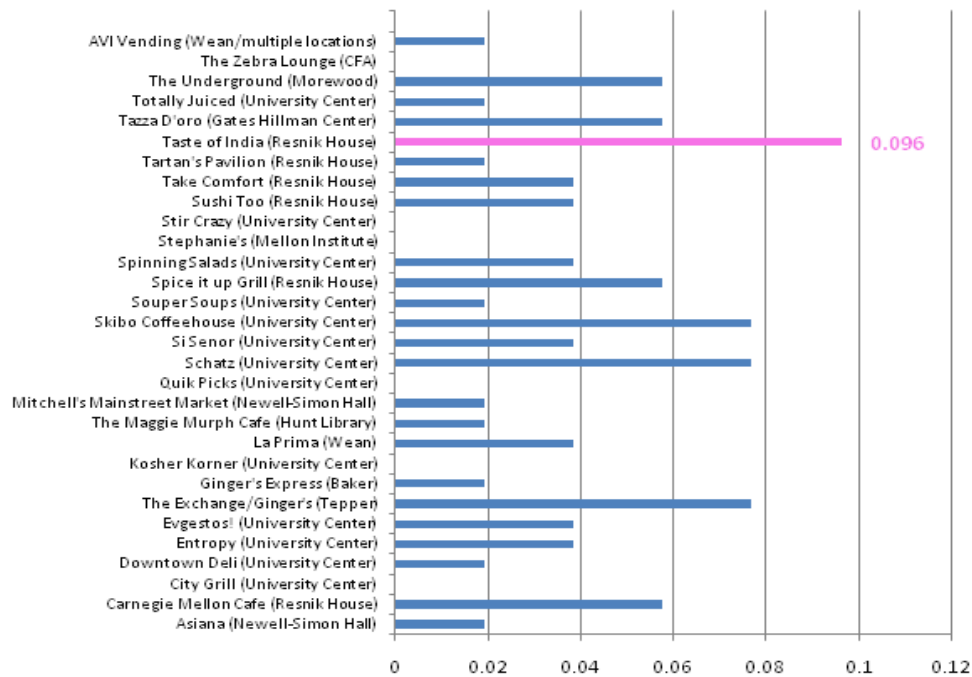
HSS Dining Locations



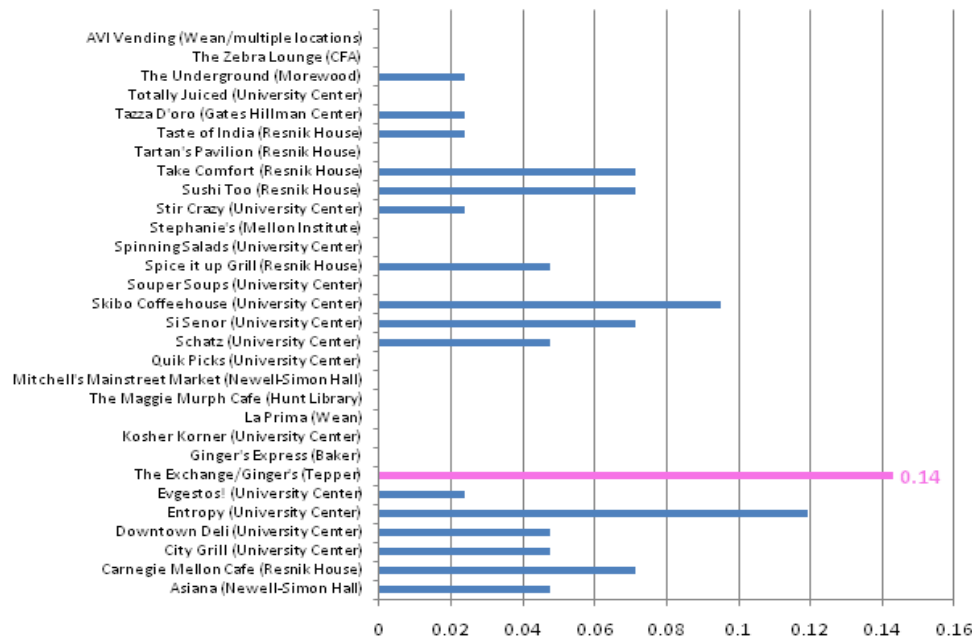
MCS Dining Locations



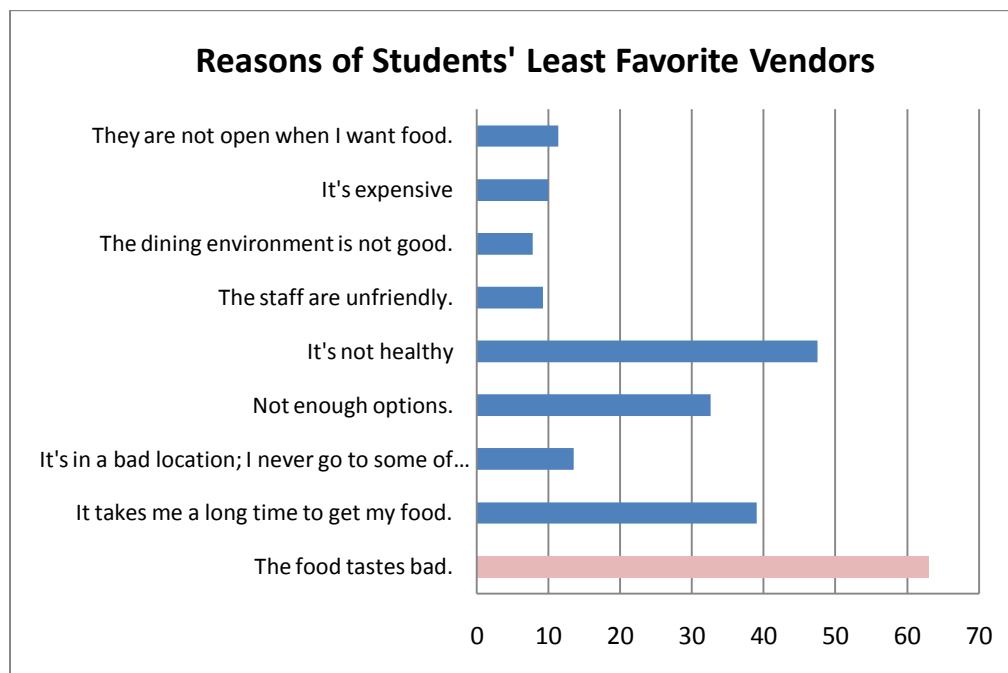
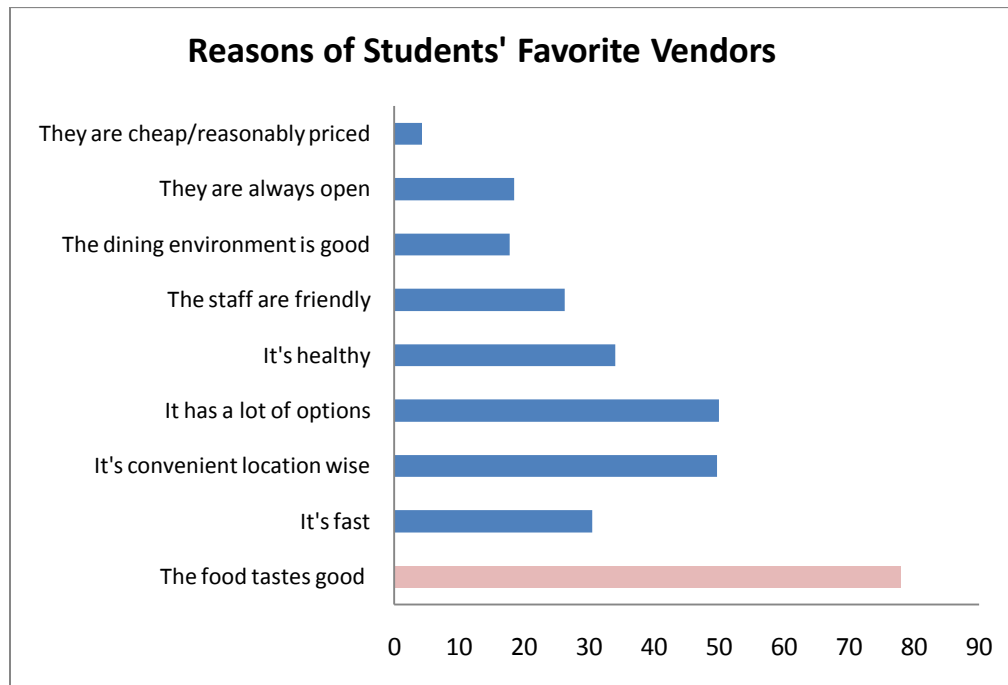
SCS Dining Locations



TSB Dining Locations



Appendix 8: Reasons for favorite/least favorite vendors

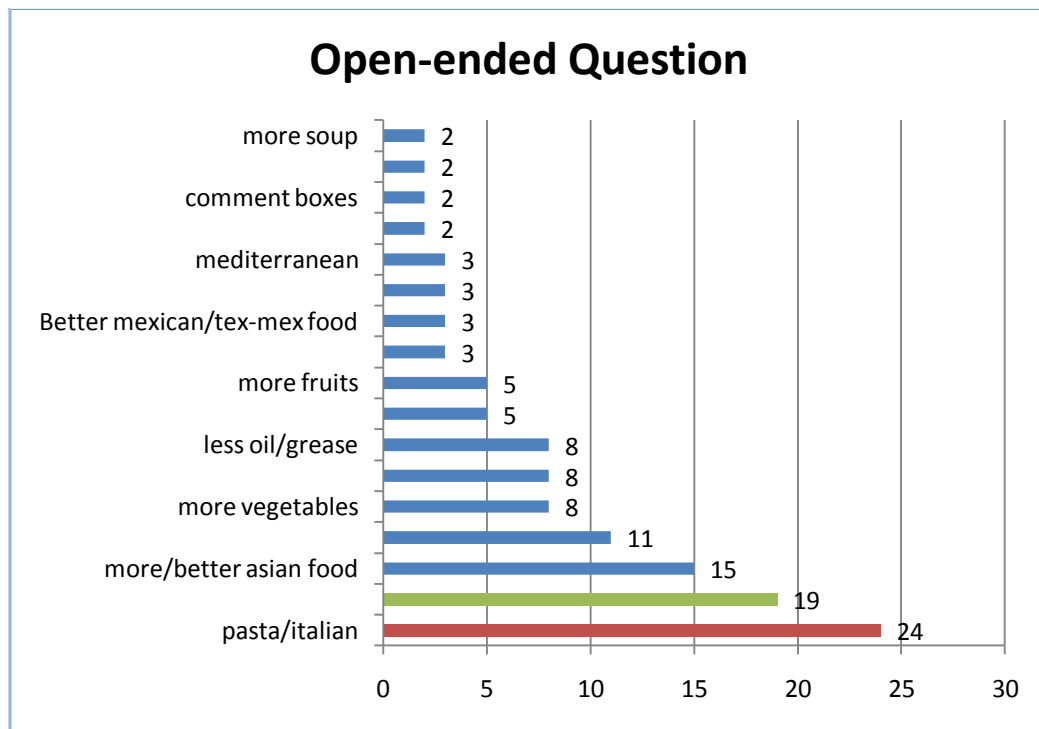


Appendix 9: Ethnicity and food type

		Food Type					
Ethnicity		Western	Asian	Indian	Mexican	Alternative	Beverage
	Asian	12.4%	3.9%	0.8%	1.8%	7.2%	0.8%
	Hispanic	1.1%	0.0%	0.0%	0.0%	0.2%	0.2%
	White	23.9%	3.1%	2.5%	2.1%	16.5%	2.8%
	Black	3.3%	1.1%	0.3%	0.3%	1.6%	0.3%
	Biracial	5.4%	0.5%	0.5%	0.5%	2.0%	0.2%
	Prefer not to answer	2.5%	0.5%	0.2%	0.0%	1.1%	0.3%

100%

Appendix 10: Open-ended question and suggestions

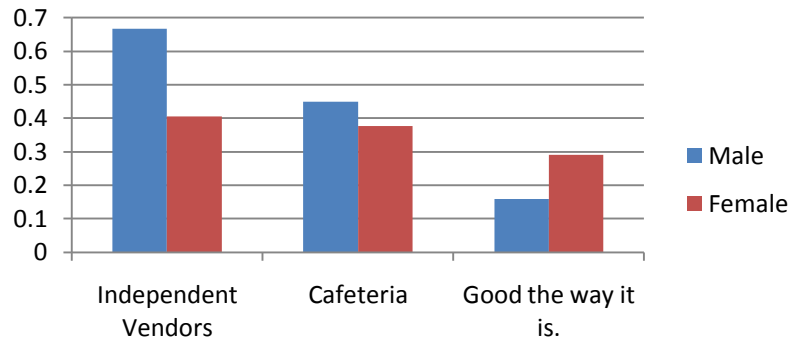


Appendix 11: Suggestions for Dining Services

***“Which of these dining services would you like to see at CMU?
(Choose all that apply)”***

- ***Independent vendors, i.e. McDonald's, KFC, Chipotle, Wendy's, etc***
- ***A cafeteria, buffet style, in most resident halls.***
- ***It's good the way it is.***
- ***Other: _____”***

Student Preferences for Dining Services



Nutrition Information Displayed?

“Would you like to see nutritional information and calorie counts on the menu boards?”

