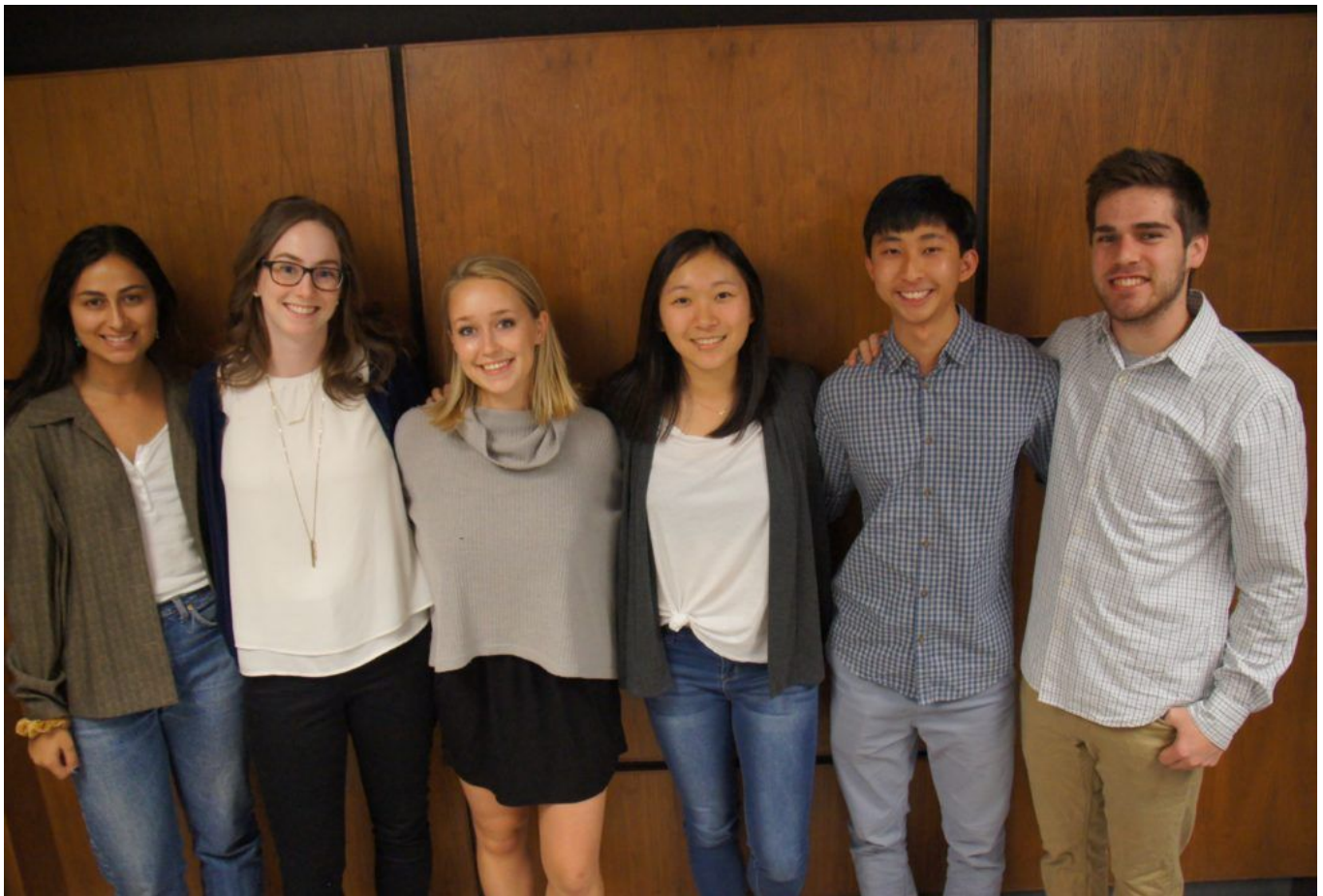




UCLA Sustainability Action Research

2018 Final Report

Assessing Impacts of Education on Food Waste Behaviors in UCLA Dining Halls

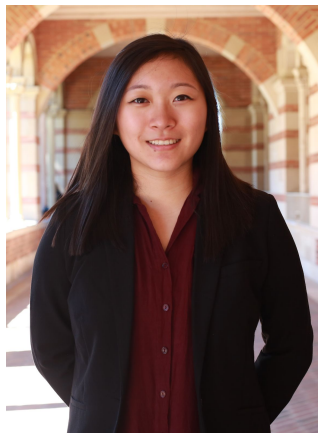


MEET THE STAKEHOLDER



Charles Wilcots is the Associate Director of UCLA Dining Services, and is the stakeholder for this year's Sustainability Action Research (SAR) Food team. Charles was vital for all the work this year's SAR Food Waste team conducted. The 2018 Food Waste team would like to thank Mr. Wilcots for all of his support and guidance throughout their project this past year.

MEET THE TEAM



Helen is a junior studying Environmental Science with a minor in Environmental Engineering. She is one of the team leaders for the SAR Food team this year, and was a team member on the Air Quality team last year. Her work with UCLA Dining Services as the Dining Sustainability Assistant has helped her develop an interest in food sustainability, which she is excited to expand on through this year's SAR project. This summer, she has an internship in Japan working with carbon neutrality, food sustainability, and renewable energy.



Ari is a third year pursuing a major in English with a minor in Environmental Systems & Society. She is one of the team leaders for the Food Team this year. Ari is passionate about environmentalism and specifically sustainability, so conducting research on food waste and challenging students to think sustainably about this issue was truly an enriching experience for her. She will be working alongside UCLA Professor Ursula Heise this summer, and will continue researching sustainability efforts but this time with a focus on urban biodiversity in the Los Angeles area.



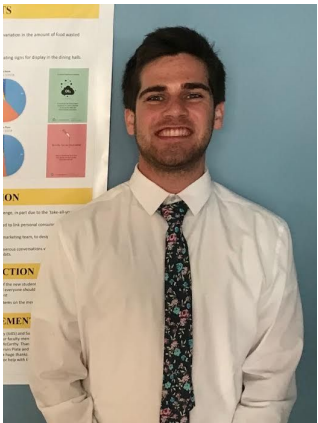
Kelsey is a third year in the Institute of the Environment and Sustainability (IoES) at UCLA, majoring in Environmental Science and minoring in Geography/Environmental Studies. She has developed a passion for working towards a more sustainable UCLA campus. For the past two years, she has helped coordinate a bike-powered, on campus music festival called Coastalong. This is her first year being a Sustainability Action Research (SAR) team member. She is looking forward to a summer at UCLA taking classes and working on a Student Research Project (SRP) involving species modelling in Los Angeles.



Desmond is a graduating senior with a major in Geography and minors in GIS and Environmental Systems & Society. This is his second year with SAR and he is excited to work on a topic really close to his heart (and stomach). He hopes to communicate the importance of mindful eating because the consumption of food not only drives our physical and mental well-being, but also greatly impacts the environment we live in. After graduation, he is returning to a tiny island he calls home, where he hopes to contribute to improving its sustainability infrastructure.



Kathleen is a graduating senior with a major in Geography and Environmental Studies and a Minor in Urban Planning. Working with the previous SAR Food Team - in her role as the RA for the Sustainable Living Learning Community - she was inspired to continue tackling student food waste this year. After graduation, she will be returning to Vancouver, B.C., and hopes to make an impact in by helping make development more sustainable.



Jacob is a sophomore who is planning on double majoring in Global Studies and Geography/Environmental Studies. This is his first year as a member of Sustainable Action Research and he hopes to return next year. An avid fan of food and sustainability, Jacob was thrilled to work on this project. He will intern this summer with Sacramento State University's Sustainability department where he will be working on creating a living building and installing a green roof.

Introduction

Our team aims to decrease student food waste in the UCLA dining facilities by making students more conscious about their food wasting habits. In the past couple of years, student food waste has increased more drastically than the increase in student population. This motivated our team to figure out a method to make more students aware of the impact their individual food wasting habits have on the environment. We decided to address this issue by creating an educational outreach campaign. The design of this campaign was based off of audit and survey data collected during Winter Quarter. After researching effective educational strategies and reviewing the data collected, we decided the campaign should include the following: 1) signage implementation in the dining halls, 2) the incorporation of nutrition and mindfulness eating into our educational materials, and 3) engagement with students through an outreach campaign on the Hill. To uncover the impacts of our educational campaign, we returned back to the dining facilities to conduct another round of food waste audits and gauge student awareness on the signage we had implemented in the dining halls. Throughout our project, the biggest challenge was designing an impactful educational campaign that reached a large number of students (i.e. engaged students either because our materials were visible or because we sparked their interest). Going forward, increasing student engagement with our team and our educational materials will continue to be a challenge that is improved upon by future teams.

Background

Food waste in UCLA Dining Halls has been a persistent issue, thus Sustainability Action Research (SAR) at UCLA has enlisted eager teams year after year to tackle the issue and pinpoint creative solutions to implement in a relatively short period of time. The Food Waste Team exists because current students at UCLA, with support from UCLA's Institute of Environment and Sustainability (IoES), believe that UCLA can push boundaries and become a more sustainable campus, especially through the

efforts of students themselves through SAR teams. Furthermore, this project was motivated by our belief that students' overall lack of awareness as to the excessive amount of food wasted UCLA Dining Restaurants on the residential hill.

SAR's 2017 Food Waste team conducted similar research revolving around the issue of food waste, which essentially paved the way for this year's research question: *can the implementation of educational outreach efforts help change excessive food waste behaviors in UCLA Dining Restaurants?* In 2017, the SAR Food Team assessed various food waste behaviors in order to implement sustainable efforts that would improve the universities food waste procedures overall. In this specific field of research, members of SAR's Food Team sought to alter the food waste amounts carried out by students and staff on campus. By focusing on *who* was contributing to excess food waste, SAR members targeted students directly and analyzed certain waste patterns that occurred at each dining common and the trends of diners themselves. To accomplish this goal, the SAR Team conducted a survey in the dining halls in order to figure out the diets of most dining hall attendees. The survey proved that consumers with dietary restrictions contributed less to food waste than those without dietary restrictions. After researching and collecting data on these trends, the team decided to facilitate a focus group with sustainably-minded students who ate at the dining halls in order to be in direct conversation with the food waste issue that was occurring. By involving UCLA students and their perspectives on the issue of food waste, SAR members discovered that visual aid was found to be appealing among students. Thus, the SAR team worked to create a visual aid that accurately represented the amount of food students were wasting after they ate at the dining halls. The members decided to create a short film in order to showcase the degree of food waste that was occurring. Furthermore, the SAR team worked to further educate dining hall consumers in an educational and entertaining way through other modes of media, significantly through memes. This method delivered the message regarding food waste issues to students and staff in the dining halls both

efficiently and humorously. As a result, SAR members found that communicating to students and staff about food waste through memes attracted the most people and was the most successful form of outreach.

In addition to the 2017 SAR Food Team being an influencing agent in our research's intentions, a study conducted at Kansas State University titled "Effectiveness of Educational Campaigns in University Dining Halls" also highlighted that educational awareness methods could reduce food waste. The study looked at the effectiveness of different types of signage and messaging. Some efforts consisted of simple message interventions, whereas other methods incorporated more personal feedback interventions. According to the study, explicit and informational messaging led to a 15% reduction in food waste; in comparison, the more personalized, feedback-based messaging did not improve upon the reduction achieved by the simple messaging. At the end of this study, researchers concluded that simple, short messaging that reminded students of their beliefs was most effective in reducing food waste. In fact, simplicity was more effective in changing student behavior than messaging that included more detailed and personal data and information. Since this study conducted by Whitehair et al. (2013), highlighted the effectiveness of educational campaigns, more resources and research must go into determining the most influential formatting practices for messaging. As such, this became a focal point and main objective throughout the 2018 Food Waste project.



Our Story/Methodology

To best accomplish our team's goal, the project was divided into two main stages: data collection and educational campaign. By isolating and focusing on data collection during winter quarter, we were able to gather relevant information that would then shape and inform our educational campaign during spring quarter.

The data collection stage was divided into two components, surveys and waste audits. Both the surveys and audits were tailored so that the team could use the data and breakdown the habits, patterns, and motives behind food waste in UCLA Dining Halls. Over 4 days, two at De Neve Dining Hall and two at Bruin Plate, from 5-7 PM, we surveyed 200 students while also conducting food waste audits. The survey was designed so we could better comprehend student food waste behavior and receive direct input from students on what they believe would be the most effective way to address the issue. Questions ranged from the student's meal plan type to what type of food they think they waste the most of. At the same time as the surveying, members of our team were positioned in the plate drop off area conducting a food waste audit. For every third student who walked through the drop off area, a team member would record the amount of food waste on the student's plate using a scale that was loosely based off the 2017 SAR Food Team's method. Our scale quantified waste by assigning it a numerical value from 0-4. 0 corresponds to no food wasted and 4 corresponds to an entire plate of food wasted, with each number in between representing a quarter of a plate. We originally planned to quantify the food waste by weight, but decided to go with this method in order to differentiate between edible food waste and non edible food waste, such as watermelon rinds. Our method was also faster and more efficient. In order to ensure consistency and accuracy in our process, the audits were conducted on two Wednesdays and two Fridays from 5pm to 7pm during dinner time. Those conducting the audit would practice the scale before beginning data collection in order to calibrate their measurements to reduce discrepancies. We measured

every third diner's plate to introduce an element of randomness into our sample. With this data in hand, we were able to move forward in the creation of our education campaign.

Based on the survey and audit data collected, we designed a three-pronged educational campaign aimed at changing the behavioral habits of students. Our stakeholder, Mr. Wilcots shared with us that many involved with UCLA Dining Services are under the impression that current excessive food waste behaviors are the result of a lack of education or awareness among students regarding the problem of food waste and its impact on the environment. We found this claim to be backed by the results of our survey. Hence, we decided to both make students aware of the magnitude of their food waste and the subsequent environmental impacts of their actions and to provide students with education and tips on how they can implement impactful action to decrease their individual food waste.

Our three-pronged campaign consisted of a signage team, a nutrition team, and an outreach event on the Hill. Our signage team worked with UCLA Housing and Hospitality Services Marketing & Communications to create signs that appear in table tents and on digital display in the dining halls. These signs: encourage students to customize their meals, show the impact of their food waste on the environment, quantify student food waste, and relate it to something familiar. The nutrition team aimed to increase student knowledge about mindful eating and thus make them more conscious about their food choices and food wasting habits. Working with Dolores Hernandez, the UCLA Dining Nutrition Education Coordinator, the team placed signs in table tents including "Nutrition Myths" and tips for healthy eating. Finally, the outreach team organized an event with free food on the hill to incentivize students to pledge and commit to "being more conscious about their food wasting habits" in order to raise student awareness about food waste and increase exposure of our signage program. With the culmination of our educational campaign, we conducted a second round of food waste audits and surveys to gauge the effectiveness of our efforts.



FOOD FOR THOUGHT!

Enjoy free food and
learn more about
food sustainability!

Wed, May 23

3-6pm

Sunset Village



UCLA Residential Life



the greeninitiative fund

Results

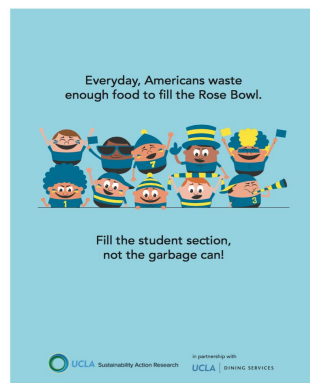
After collecting data from audits and surveys, we analyzed the the students' food waste and survey responses. We expected diners at Bruin Plate to have less food waste than diners at De Neve, based on data from last year's SAR team. From the audits during the winter quarter, our team observed a fourth of a plate of food wasted on average per student, with slightly less food wasted at Bruin Plate. The survey results from Bruin Plate and De Neve showed that students thought they wasted the most carbohydrates and vegetables/fruits. The students also thought that the most effective approaches to mitigating food waste at UCLA Dining halls were to emphasize customization of meals and to have incentives to not waste food. Since creating incentives to not waste food was out of the scope of our project, we decided to go with the third most highly rated option, which was to create signage about food waste. Additionally, most students indicated that having widespread nutritional information would also influence their food choices. On the other hand, they thought that focus groups and smaller portion sizes were the most ineffective methods. After analyzing the results from the survey, our team began creating the educational component of our project.

We designed a multifaceted educational campaign with three different aspects aimed at changing the behavioral habits of students. The components of the campaign included educational signage, nutritional signage, and an outreach event. The signage team worked with UCLA Housing and Hospitality Services Marketing & Communications to produce signs that can be placed in the table tents at the anchor restaurants and displayed on digital displays around the dining halls. These signs will have a lasting impact at the dining halls, because they can be continuously displayed for the foreseeable future. The nutrition team worked with Dolores Hernandez to recirculate nutritional pamphlets in the dining hall table tents. These pamphlets can also continue to be displayed, and renewed interest in the nutritional signage program could result in the creation of redesigned nutritional signage. Finally, the outreach team worked with UCLA Residential Life to host an event on the hill. Using funds from The Green Initiative Fund (TGIF), we purchased food from Veggie Grill to give students an incentive to come talk to us and learn about our project, learn about food waste, and pledge to be more food conscious. Overall, we had more than 100 students join the pledge and add their name to our pledge poster. After the outreach event, we displayed the poster at the two dining halls, Bruin Plate and De Neve, to further raise awareness about food sustainability and our project with SAR as a whole.

The spring quarter audit results showed some change in students' food waste behaviors. We noticed an increase in the number of 0s and 2s and a decrease in the number of 4s and 3s. In addition to the food waste audit, we also conducted a quick survey, asking students if they had noticed the food waste signage, nutritional signage, and outreach pledge poster in the dining halls. This was to gauge how many students we had reached through our signage. Our results showed that there was a 9% increase in the number of students that had seen the signs within the span of a day.

When interpreting our data, there are multiple factors to consider that could have influenced our data. First, our food waste audit methodology was subjective, which could have skewed our data. Although we did our best to calibrate our ratings, different members could have still rated plates

differently. We further tried to make our ratings consistent by having multiple team members at each audit, so that they could keep each other consistent. In addition, the fact that our audits were not double-blind could have influenced the way we rated food waste. We hypothesized that students who dined in Bruin Plate would waste less food than those that dined in De Neve, and we also hypothesized that the amount of food that students wasted would decrease from winter to spring quarter. Because we knew when and where we were auditing, we could have been unknowingly biased when rating plates in order to fulfill our hypotheses. Furthermore, the timing of the implementation of signage could have varying effects on students' behaviors. Implementing signage when new students are just arriving in fall quarter, when they are still forming their habits, may be more effective than in spring, when they have already established their lifestyle habits. Additionally, the educational signage was only implemented a day or two before our spring quarter audits. This did not give a lot of time for students to notice the signs and alter their behaviors. Lastly, not all of the tables in the Dining Halls had table tents, which would limit the amount of students that could be exposed to the signs.



Discussion

The results of our data collections and food waste audits that we conducted in the UCLA Dining Halls ultimately provided our team with various perspectives on where this issue is stemming from, and more so how much food is actually being wasted. During our Winter audits and our distribution of a short

survey taken by student diners, our team discovered that, on average, a quarter of a plate of food was being wasted by students, and more so, that students were engaged in the fact that food waste was in fact an issue in the dining halls. Our survey collection essentially provided us with the insight that the majority of food being waste by diners were carbohydrates. Thus, we took this information and conveyed the solution of students being able to customize their meals or simply only ask for what they are going to eat, on engaging signage placed throughout the dining halls. Moreover, the Winter audits showcased how many students were in fact consuming most of their food, yet that there were still a number of students wasting plates of food. Thus, when conducting our Spring audits, our team wanted to observe if our informative signage, nutritional cards, and food waste event on the Hill had in fact made an impact on student diners and their food waste behaviors. Essentially, we recognized that there was a decrease in the number of students wasting full plates of food, and we attribute this to students being exposed to our signage and thus becoming more conscious about food waste. Furthermore, we surveyed students as they were exiting the dining halls to see if they had noticed our signage in the dining halls, and there was a 10% increase from the first day we conducted the survey to the second day of how many students had in fact seen our signs.

Essentially, our team observed that there were various trends in relation to who was wasting the most food and what types of food were being wasted where. Again, we observed that carbohydrates and dessert items were being the most wasted, where was main entrees were typically most consumed. Furthermore, we discovered that students with dietary restrictions, such as being vegan/vegetarian/gluten-free/pescatarian, had noted on our survey that they feel like food waste is an issue on the Hill. It was also illuminated that diners in Bruin Plate specifically were also more aligned with the notion of food waste being a detrimental issue. On the other hand, students without dietary restrictions and students who were wasting food other than for nutritional reasons, marked that they didn't see food waste as an issue at UCLA. Moreover, it was apparent that diners in Bruin Plate were wasting

less food than diners in De-Neve, and we connected this to the fact that Bruin Plate utilizes smaller plates in serving food, versus allowing diners themselves to take however much food they want on their own plates.

Centrally, our team believes that if we had displayed our signage even earlier during Spring Quarter, that a majority of diners would have recognized our signs and that thus food waste would become an even lesser issue. However, our team successfully distinguished that informative signs, nutritional cards, and interacting directly with students about this issue did in fact have a pivotal role in how the dining halls and their diners were becoming more sustainably-minded.



Challenges

While there were no significant setbacks throughout the project, there were several challenges that the team was faced with throughout the two quarters of research. These challenges included standardizing measurement procedures for the food waste audits, defining a scope that is both realistic and impactful, finding creative ways to engage students, and learning how and where to get approval within a large institution.

Developing standardized measurement procedures is a task that all research efforts are concerned with. After some difficulty getting access to a scale in time to conduct the audits during winter quarter, our team made the decision to utilize a more qualitative form of measurement; this is described in the methods section. The qualitative audits allowed the team to not only grasp the weight of the food waste

issue, but also to observe the variety and prevalence of foods being wasted. For example, during the audits, it was observed that a lot of the foods wasted were side dishes and starches. This was informative for the programming initiatives, because it was concluded that emphasizing customization would be an effective way of reducing food waste. Thus, while we continuously thought about how to improve the objectivity of the audit methodology, there were important benefits of choosing a more qualitative route.

Another challenge that arose was how to define a scope that allows for achievable and meaningful impacts. On a campus with over 30,000 undergraduate students and many more graduate students, faculty, and staff, there are countless food vendors, restaurants, and sources of food waste on campus. It was decided that the project would focus only on UCLA dining restaurants on the residential hill. This decision was based on a few factors, the first of which being that the majority of eating behaviors developed by students are developed early on. As a vast majority of incoming freshmen live on campus, targeting the residential hill seemed to be an ideal course of action for a two-quarter research project. Additionally, it is our belief that the dining behaviors developed while the students live on the residential hill will be carried with the students as they move throughout the rest of their college careers. If positive behaviors can be defined early on, then the impacts of food waste programming on the residential hill can be spread throughout the school. Finally, the residential hill is an ideal place to implement programming, as there are several routes for implementing signage and conducting community outreach. This is additive to the willingness of UCLA dining services and Housing to continuously improve programming and make the on campus living experience as enriching as possible.

Another fundamental challenge throughout the research process is how to engage students. It is a reality that not all students are as conscious or passionate about the environment and how their actions impact the environment. Because this project deals mostly with engaging students and changing the on campus culture to encourage more sustainable behavior, getting the attention and support of students living on campus was of utmost importance. It became our focus to start conversations with students who

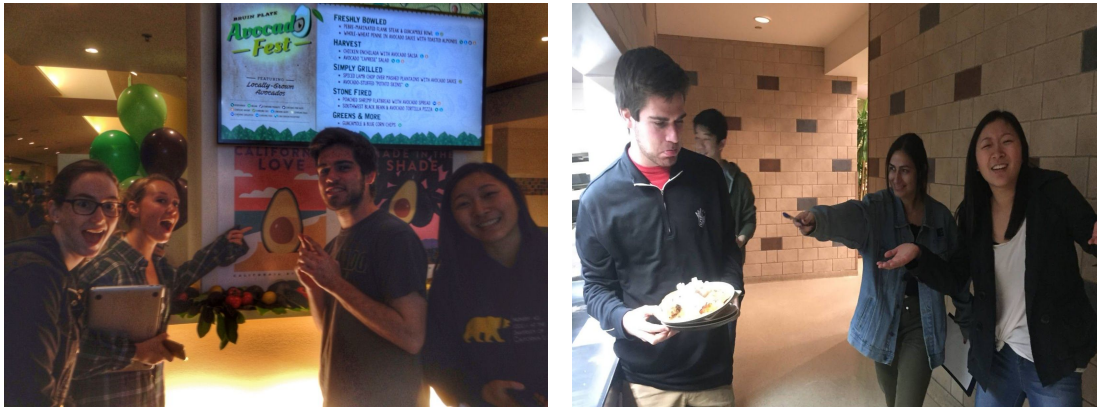
are more unaware of sustainability and food waste and give those who are already passionate confidence and support. There were many individual students that attended the community outreach event, and expressed their own passion to modify campus culture and reduce food waste. Just making the issue of food waste more visible and encouraging students to start the conversation with their friends is a strong start to modifying campus culture. Overall, engaging students will always be a challenge in a project of this nature, but focusing on increasing the visibility of the issue and starting a discussion is the best way to engage.

Finally, an issue that all of the SAR teams likely face, was the question of how and where to get approval for the programs and plans we have been excited to implement. Our stakeholder, Charles Wilcots, was extremely helpful in giving us the tools and knowledge to get approval. This challenge, however, is an important part of the Sustainability Action Research program; the entire two-quarter project is a learning process and, in many ways, helps break down the complex sustainability landscape at a large university like UCLA.

Conclusion

The 2018 SAR Food Team's main objective was to assess the consumption habits of students in the residential dining restaurants and to promote the relationship between mindful eating and the impact on the environment. As one of the many groups on campus dedicated to promoting sustainable food practices, our project was built upon previous and existing efforts to combat food waste at the dining halls. The bulk of our research was executed through food waste audits and surveys, which we conducted in Winter and Spring quarters to see the impact of our educational initiatives. We worked with different stakeholders, such as the UCLA marketing department and the resident Nutrition Education Coordinator to implement signage in the dining halls related to food waste and nutrition. In Spring quarter, we also

organized an outreach event at Sunset Village to raise awareness of food waste issues and the individual efforts student can make to reduce their personal food waste.



Future Recommendations

The 2018 SAR Food Team sees many opportunities for future SAR teams and UCLA Dining Services to promote sustainable food practices on campus. The first is to implement an educational component related to sustainability/nutrition during student orientation. This could be in the form of giving new students a tour of a dining hall kitchen; seeing how their food is prepared and knowing where their food is sourced will make them more aware of the importance of eating sustainably. However, we foresee potential challenges with this idea as the New Student Orientation is under the jurisdiction of UCLA Admissions. We will have to work through additional bureaucracy in order to implement programs during the orientation period. Along the same lines, it would be highly beneficial to incorporate an educational component into Residential Assistant (RA) training and require them to integrate sustainability into some of their programs throughout the year. Majority of the consumers at the dining halls are also residents, making it all the more convenient and important for RAs to convey the significance of eating mindfully.

UCLA Dining should continue to hold sustainable food-themed events in the dining halls throughout the year. As part of our research, we went down to one of these events, which featured

locally-sourced avocados, to observe student participation general attitude towards adopting sustainable food practices into their lifestyles. These events were well-received and could potentially serve as avenues for UCLA Dining to convey information to students. We also feel that it will be most effective to implement educational signage in the dining halls at the beginning of Fall quarter as that when students begin to form their eating habits.

In order to gain a clearer and more objective assessment of food waste trends among diners, we feel that it will be beneficial for next year's Food Team to focus on quantifying waste audits. This will be similar to the efforts of the 2009 Waste Watchers team, which managed to obtain valuable statistics (average amount of food wasted per diner in lbs) by conducting a total of 10 food waste audits throughout Winter and Spring quarters. Obtaining an updated statistic and comparing to previous data would lend insight as to what has changed and what more needs to be changed.

References

- Johnson, Destiny. Garcia, Jocelyn. Theocharides, Sabrina. Chi, Alison. Witiw, Eric. Creager, Danna. *Assessment of Food Waste Behaviors in UCLA Residential Restaurants*. UCLA. 2017.
- Whitehair, Kelly J., Carol W. Shanklin, and Laura A. Brannon. "Written messages improve edible food waste behaviors in a university dining facility." *Journal of the Academy of Nutrition and Dietetics* 113.1 (2013): 63-69.

Appendices

I. Survey

UCLA Dining Common Survey - SAR 2018

Which meal plan do you have?

19P 19R 14P 14R 11R

What year are you?

1st 2nd 3rd 4th Graduate N/A

Do you have any dietary restrictions? No

Yes _____

The most common food type that I waste is/are (circle all that apply):

- a) Desserts (Pastries, Ice Cream)
- b) Vegetables/Fruits
- c) Protein (Meat)
- d) Carbohydrates (Pasta, Pizza, Grains)
- e) Others _____

The most important factor in my food choice is:

- a) Taste
- b) Nutrition
- c) NA - I just want to satisfy my hunger
- d) Line Size

I am _____ of the nutritional value of the food I consume:

- a) Very aware
- b) Vaguely aware
- c) Unaware

Would calorie count/nutritional content on signage in the dining hall impact how much food I would take?

- a) Yes
- b) No

I would waste less food if (circle all that apply):

- a) I knew I could customize my meals
- b) The food tasted better
- c) I had gotten my food in multiple stages
- d) The portions were smaller
- e) The lines were shorter

I think that food waste is an issue at UCLA Dining:

- a) Yes
- b) No
- c) I'm not sure

Rate in order of effectiveness ways UCLA Dining can reduce food waste:
(1=most effective, 5=least effective)

- _____ Using signage to remind students not to waste
- _____ Making portion sizes smaller
- _____ Encouraging students to customize their meals
- _____ Hosting a focus group/nutrition class for students every quarter
- _____ Providing incentives for students who do not waste food

When do you go to the dining hall?

- a) I go to the dining hall at roughly the same time every day.
- b) I go to the dining hall when I feel hungry.
- c) I go to the dining hall at random times, and somewhat erratically.

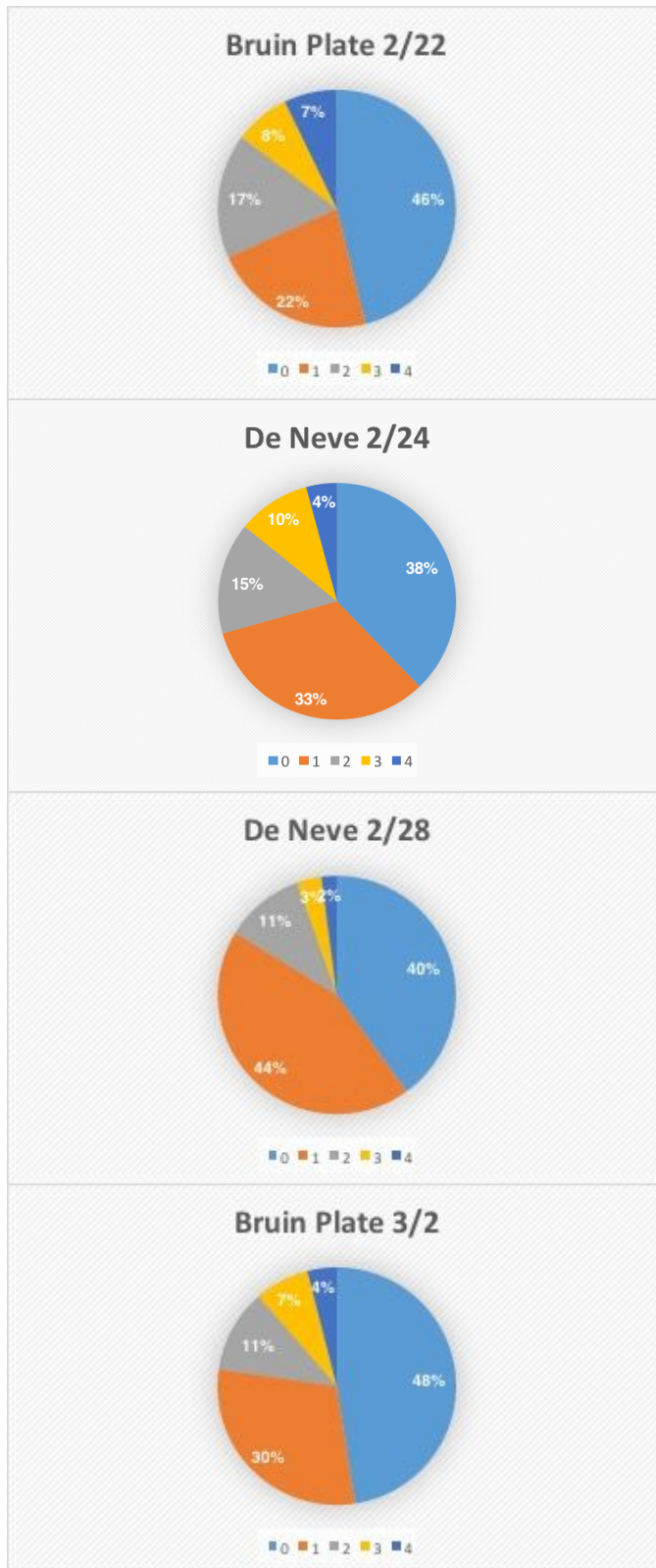
Who do you go to the dining hall with?

- a) No one. I usually eat by myself.
- b) A group of friends.
- c) One or two friends.

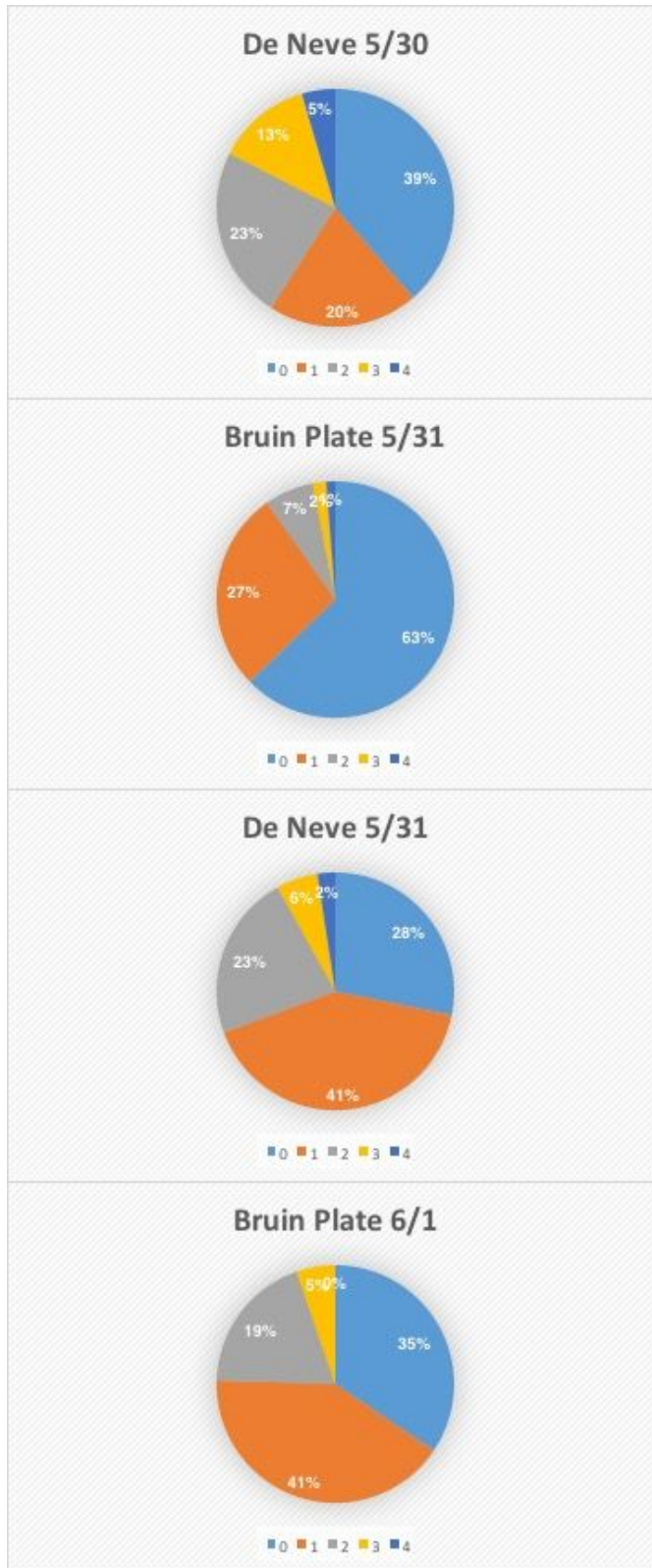
On average, how many plates of food do you get during one meal?

II. Audit Data

a. Winter Quarter Individual Audits



b. Spring Quarter Individual Audits



c. Winter and Spring Overall Comparison

