

UCLA Sustainability Action Research: Plastic Policy Implementation

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Abstract

The University of California, Los Angeles (UCLA) has focused on transitioning away from plastic dining ware in favor of more sustainable alternatives. This requires comparing current costs and benefits of dining ware to reusable and compostable options. While the environmental benefits of switching from disposable are well known, much less is known about overcoming the financial, operational, and consumer-behavioral constraints that often discourage universities from converting sooner. The current research evaluates reusable alternatives to UCLA Dining's standard operating procedures. Data was collected in the form of student focus groups, informational interviews with other universities that mandated reusables program, a mass student preference survey, and lastly a targeted pilot program conducted in UCLA's residential halls. Preliminary findings were generally positive, and show that students are receptive towards participating in university-mandated reusable programs. However, the main logistical obstacles for this would be to boost awareness of these programs and accountability for students to return dishes and wash their own utensils. Students prioritize convenience and conciseness in program design and messaging. These factors will likely be the biggest obstacles to overcome towards widespread program adoption and normalization. We recommend conducting a larger-scale pilot without the boundaries of COVID-19 in order to ensure the reproducibility of our results.

Introduction

The University of California, Los Angeles' (UCLA) commitment to eliminating single-use plastics via the Single-Use Plastic Policy requires its dining services to reconsider the types of dining ware it will provide to students. PLA bioplastics, which UCLA Dining has been using, will no longer be accepted by Athens Services, UCLA's composting facility as it takes too long to break down, even commercially. Consequently, the research project aimed to find

alternatives to current dining ware that satisfy both Athens Services' new restrictions and the preference of UCLA Dining, Sustainability, and students. We investigated the feasibility of implementing a reusable dining ware program at UCLA while conducting market research to source new compostable or marine biodegradable materials accepted by Athens Services. Research for the project included financial analyses of current dining purchases, student focus groups, and informational interviews to learn more about other universities' reusable dining ware programming. Also produced were detailed reports on student preferences and behavior via a quantitative data-focused survey and a pilot program for reusable utensils. Finally, we conducted financial analyses to calculate costs and savings from a proposed reusable utensil program into UCLA Dining's budget, to identify and evaluate the feasibility of launching such a program. Ultimately, the research project resulted in recommendations to UCLA Dining for cost-effective reusable dining ware programming that took students' existing behavioral patterns and preferences into account.

Methods

Informational Interviews

We conducted informational interviews to gather information regarding the existing landscape for reusable dining ware programming at other universities similar to UCLA. With each of the interviewees, we reviewed the advantages and disadvantages of each of their university's reusable dining ware programming and strategized ways that UCLA could implement a program of its own. Overall, we asked open-ended questions to capture the interviewees' impressions of reusable dining ware at their respective universities and covered topics ranging from student feedback, program options, logistical challenges, and general advice on building a UCLA program.

The universities selected for interviewing were the University of Massachusetts at Amherst, Dartmouth College, UC Berkeley, UC San Diego (UCSD), UC Merced, and the Massachusetts Institute of Technology (MIT). We selected some universities, including UC San Diego and UC Berkeley, from our stakeholder Sustainability Manager Erin Fabris's existing contact list. Meanwhile, we sourced the other universities during our literature review process, focusing on interviewing universities that had publicized the existence of a reusable clamshell program..We conducted interviews over Zoom with either a staff member responsible for operating the reusables program or with students operating a research project similar to ours. Each interview lasted around thirty to sixty minutes.

Focus Groups

The objective of the focus groups was to understand student attitudes towards dining preferences and sustainability in practice. We sourced current UCLA on-campus residents as participants for the survey and selected individuals from a pre-screening survey. This pre-screening survey was both sent to Residential Assistants in charge of communicating to their respective floors residents, and posted to official UCLA student Facebook groups pertaining to each class. The pre-screener included questions about student demographics (major, year in school, current residence on the Hill), preferences toward sustainability, and distractor questions to prevent students from figuring out the purpose of our research. We used stratified random sampling to select a group of students that would differ in their values toward sustainability. Based on their answer to how much they incorporate sustainability into their daily life on a 1 to 10 scale, we randomly selected three to four students each from those who were not sustainability-focused, moderately sustainability-focused, and highly sustainability-focused. Selected students ranged from first through fourth years and varied in their area of academic

study. We advertised that these students would receive a \$25 gift card for the UCLA Store as an incentive for participating; the funds were acquired through a grant from The Green Initiative Fund. Additionally, we notified students that UCLA staff would not be present at these meetings and that their responses would be kept confidential and only used for the purposes of improving UCLA Dining.

We had three to five participants and three team members for each call, with one team member facilitating while the other two took notes and proposed follow-up questions. We prepared prompting, probing, and situational questions about priorities in the dining experience, sustainability in dining, and their reactions to various potential alternatives to single-use plastic. These questions can be seen in Appendix Item A. We included visual aids, e.g. photographs of the dining ware, to ensure that students fully understood the questions. We also included the Zoom annotation tool to facilitate writing down a pro/cons list for what they liked and disliked about UCLA Dining.

Surveys

To gain a broader understanding of UCLA students' perceptions of sustainability and openness to potential operational changes, our team created and distributed a survey targeted at residents on the Hill. Similar to the focus group pre-screener survey, we sent out the survey as a Google Form, distributing it through Residential Assistants for students living on the Hill, as well as in the official class Facebook groups, with the goal of reaching a wide variety of students with multiple opinions. Before respondents started the survey, they were informed that our group was a student research group assisting UCLA Dining in phasing out single-use plastics. Lastly, we offered \$10 UCLA Store gift cards for every tenth respondent (capped at ten gift cards) as an incentive to fill out the survey.

The survey we sent out consisted of primarily quantitative questions to objectively evaluate potential outcomes. It began with a series of demographic questions that can be referred to in Appendix Item B. Next, the survey questioned about general attitudes towards sustainability. We asked students to self rank how important sustainability is to them, what reusable products they currently use, and about dining preferences at UCLA. Further, the survey pivoted into questioning preferences for reusable utensils. These questions asked about ranking preferred utensil materials , as well as logistics of the program, such as if students preferred opt-in or mandatory usage and hypothetical usage. Lastly, the survey asked questions regarding reusable clamshells. The clamshell section closely mimicked that of the reusable utensil section, asking for prioritization of materials as well as reactions to various hypothetical situations.

We unexpectedly met challenges from survey bots automatically filling in our survey. As such, we removed responses in which the “Name” field was listed in the format of first name, middle initial, and last name. We also removed duplicate responses with non-existent UCLA majors. We then relaunched the survey with more security protections, including a CAPTCHA code and specific questions to ensure respondents were reading the survey questions, to help filter out valid responses versus bot ones.

Reusable Utensils Pilot Program

From Tuesday, April 20th, 2021 to Tuesday, May 18th, 2021, our team organized and implemented a reusable utensils pilot program. To organize the program, the Office of Residential Life assigned three floors to our pilot program: De Neve East, De Neve West, and Sunset Village Courtside. Bamboo utensils and pouches were acquired from Kikei Wong, the Zero Waste Manager. We also acquired 30 sets of metal utensils from UCLA Dining and distributed them in the same pouches that the bamboo utensils came in to reduce waste and

minimize differences between the metal and bamboo utensil sets. Our intention was to randomly distribute metal and bamboo utensils to the selected interested students to compare attitudes to the program with respect to material.

Due to a higher number of interested participants than anticipated, we decided to roll out the program in two phases across four weeks throughout April and May. Phase One was released to 43 total students across Sunset Village and De Neve West, and later Phase Two was released to 45 De Neve East residents. Prior to handing up utensils, we contacted participants with utensil pick up instructions and program directions via email using the contact information provided by Residential Assistants. Because of COVID-19 restrictions in place, participants were required to pick up their utensils from the residential hall front desk, and materials were randomized by the Residential Assistants.

Students were given a full set of reusable utensils, including a fork, knife, spoon, and chopsticks. Their tasks were to use the utensils as they wished and document their experiences through the entrance and exit surveys we provided. Students were also required to wash their own set of reusable utensils. Before beginning the program, they filled out an entrance survey as a measure of their preliminary attitudes; this survey was identical to the main student survey mentioned earlier. The exit survey was segmented into two parts, one for those who utilized the utensils and another for those who did not pick up the utensils. The goal of this survey was to understand student concerns and obstacles regarding the program for future improvements and implementation.

Financial Analysis

We first analyzed the breakdown of spending by UCLA Dining on marine degradable versus non-marine degradable disposables. We obtained itemized data on sale of disposables

from Individual Food Service to all four to-go boutique restaurants at UCLA, for both a pre-COVID period and for the post-COVID period of January 1st, 2020 to November 30th, 2020. We developed a quick spreadsheet formula to categorize all line items with plastic-related terms in their description, i.e. PP, PET, PLA, PS, PSM and plastic, as non-marine degradable. We analyzed pre-COVID financial spending by first identifying (1) the category of disposables, i.e. hot cups, cold cups, bowls, bowl lids, cutlery and miscellaneous and (2) the degradability of disposables, i.e. whether the item was marine degradable or not. Subsequently, we were able to calculate the cost by category for (1) all disposables and (2) marine degradable disposables only. This analysis was performed for all four to-go boutique restaurants. Finally, the results from each of the four to-go boutique restaurants were aggregated into charts showing the overall cost by category and cost by degradability.

Subsequently, in line with our team's Spring 2021 focus on utensils, we worked on our main goal of calculating the cost savings from switching from disposable to reusable utensils. We first obtained data from UCLA Dining tallying the average daily counts by restaurant location for 2019-2020, pre-COVID. At the same time, we contacted the reusable utensils vendor, Jag Forms, that UC Berkeley had previously used for a quote. Finally, we calculated utensil usage rates and uptake rates from our pilot program. Combining these data sources, and conditional on the pilot program usage rates, we calculated the daily and yearly costs and savings for 0%, 25%, 50%, 85%, 100% and 27.27% (corresponding to pilot program) uptake rates. Further, we also calculated the reduction in disposable sets and per person usage of reusable utensils required at breakeven rate.

Results

Informational Interviews

Informational interviews with universities revealed differing levels of success for reusable programming at universities with diverse student population sizes, implementation methods, and dishwashing capacity. While the reusable container programs at Dartmouth and UCSD were still under operation, other universities such as UC Merced and UC Berkeley canceled their reusables programs. Overall, the universities we interviewed recommended UCLA start with a small-scale pilot program and solicit feedback from students before scaling up.

Each of the reusable programs also reported different advantages and disadvantages to their methods of producing reusable programs. Half of the universities employed the Ozzi system, an appliance resembling a vending machine to collect used containers; others used an in-house token system such that students could exchange unwashed containers for a token to redeem a new container. Universities using the Ozzi system appreciated how Ozzi streamlined the collection process but cited a high upfront cost for installing the machines. Some universities, like UCSD, estimated a two-year return on investment. However, Ozzi did present technical difficulties. Both UCSD and UC Merced had problems pairing student ID cards to the Ozzi machine, giving rise to temporarily lower return rates for containers. The general sentiment toward the Ozzi system is that it is a great supplemental tool as a collection point for containers but does not eliminate university dining's responsibilities of encouraging students to return containers on time, training staff on the program, or transporting containers between locations.

Both in-house and Ozzi system reusable clamshell programs faced problems with students returning containers promptly and to the right place. Dining staff at all schools mentioned a trend of students hoarding containers or returning them in a damaged and or moldy condition, which would leave some universities with an inadequate number of clean clamshells to supply to students. Incorporating financial buy-in or limiting the number of containers a

student can check out at a time typically alleviated some of these issues. For financial buy-in, universities charged students at a price ranging from \$2 to \$10 for either their first container or for ones they had used and damaged. Often, universities had a token system (at Dartmouth, they used carabiners to clip onto students' backpacks) or swipe system to return containers and check out containers at a future time.

Interviewees did not mention increased dishwashing and drying costs as areas of concern for these reusable programs; however, some universities, like Dartmouth and UCSD, highlighted having to shift a few operating procedures around to accommodate a higher dishwashing and drying capacity.

For reusable utensils specifically, most universities did not have formalized programs tracking usage and uptake. Some universities, including UC Berkeley, UC Merced, and MIT, provided utensils for free to students; Dartmouth experimented with one. The types of reusable utensils provided at these universities included stainless steel utensils and Ozzi brand plastic utensils. For UCLA programs, UC Berkeley suggested looking into the supplier, Jag Forms, for their reusable utensils and case, costing around \$2 to \$3 per set. Because students were responsible for bringing it to the dining location and washing it themselves, there is a lack of data collected about utensil behavioral patterns, which our project hopes to fill. In general, though, student receptivity to reusable utensil programs was positive.

Given the limited information about the reopening of dining facilities to full capacity and the continued need for UCLA Dining employees to remain socially distant throughout our research, UCLA Dining may want to use suggestions from these interviews to create multiple rounds of piloting before launching any large scale reusable clamshell program. For reusable utensils, we will discuss our findings for UCLA students later on.

Focus Groups

The focus groups revealed students prioritize convenience, efficiency, choice, and food quality over sustainability or packaging in dining operations. Specifically examining the packaging, most students voiced that neither sustainability nor the appearance of the packaging changed their preferences toward any specific dining ware. Their main concern for the packaging was its durability, such that hot or liquid foods within the dining ware would not render it soggy or flimsy. When probed for sustainability, students expressed a lack of awareness or confusion of campus sustainability measures; many of the participants indicated that they were unaware of the Single-Use Plastic Policy and were still unsure how to sort their trash or compost. The students suggested improving education about sustainability and plastic alternatives as well as programs with clear messaging and free items. Students also mentioned their concern that many residents may lack the incentive to opt-in to reusable dining ware programs if UCLA Dining did not make reusables the default choice.

In terms of sustainability, many students expressed being motivated by signs such as the Carbon Footprint Scorecard to eat more sustainably, switching to a plant-based alternative that they would not have considered previously. They also provided feedback on past/ other sustainable programs in UCLA Dining, namely the 2018 reusable water bottle program and the request-only policy for plastic straws. For the water bottle program, students noted unclear messaging as a significant weakness for the program. Though the water bottles were popular at the start of the quarter, mixed messaging about the discount incentive for non-meal plan fountain drinks and lifting policies that would allow students to bring the water bottle to dining halls discouraged students from participating. Similarly, with plastic straws, students reported that straws were still freely being distributed to students, especially at the start of the pandemic,

prompting students to construe the misconception that drinking directly from the soda cups was less sanitary than using a straw. Overall, this confirms that successful programs for students should prioritize accessibility, convenience, and salient marketing that will incentivize participation, whether or not those messages directly focus on sustainability.

Survey

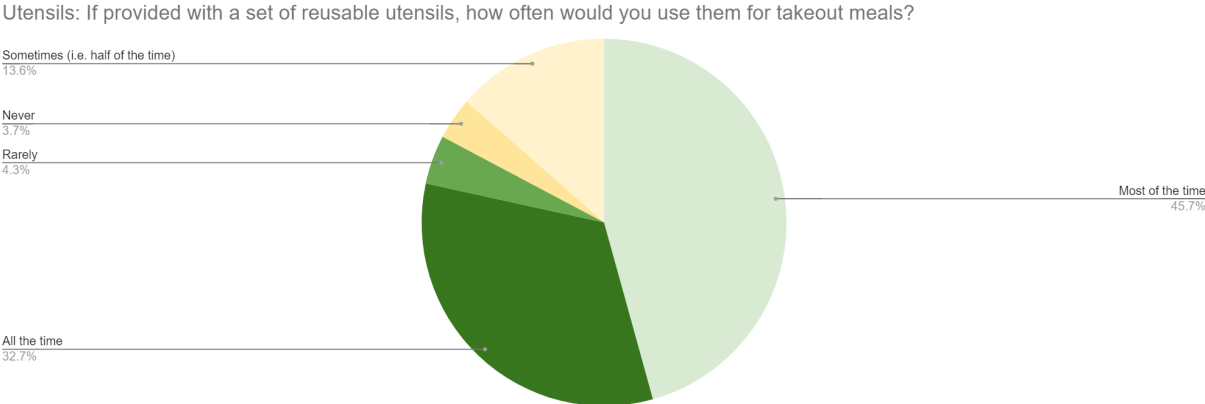
Since the entrance survey for pilot program participants was identical to that of the main survey rolled out across UCLA, the results of both surveys were analyzed together for a total of 162 respondents. Their demographics are as follows:

Variable	n	Percent
Current living location		
On the Hill	62	38.3
Off-campus apartments in Westwood	36	22.2
Outside Westwood	64	39.5
Year		
First	47	29.0
Second	57	35.2
Third	41	25.3
Fourth	16	9.9
Fifth	1	0.6

On average, respondents ranked the importance of sustainability to them as 5.4 (1 = not important; 10 = very important), suggesting that our respondents were fairly representative of a range of interests in sustainability. When asked about their priorities for a good takeout dining experience at UCLA Dining, respondents ranked durability of material, environmental impact of packaging and convenience as the most important, in that order. In comparison, unique-themed packaging was less of a priority.

To gauge enthusiasm towards sustainability and openness towards using reusables, respondents were asked which reusable items they used. Water bottles were the most popular item, with 154 respondents saying they used reusable water bottles. 147 reported using reusable shopping bags, 111 used meal containers, and 81 used reusable straws. A sizable portion of survey respondents, 123, indicated that they already used reusable utensils, which suggests that they are already accustomed to using reusables and might be more receptive towards a reusable utensils program. However, this did not specify that the utensils were used as a to-go option.

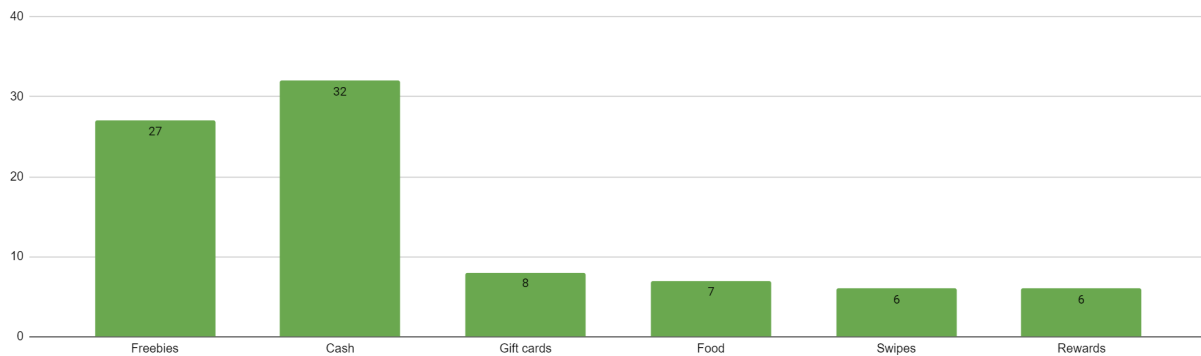
With regard to reusable utensils, respondents ranked their preferred material as metal, followed by bamboo then durable plastic. A majority (69.1%) preferred that a reusable utensils program be opt-in as opposed to mandatory. When asked how often they would use reusable utensils for takeout meals if provided with a set, 32.7% of respondents mentioned “all the time”, and 45.7% of respondents mentioned most of the time. 82.7% of respondents also indicated that they would be comfortable washing their utensils given existing dorm facilities.



Respondents overwhelmingly suggested that freebies and cash incentives would encourage them to participate in a pilot program. Some respondents also suggested free food or free swipes. However, we wish to caution that free giveaways, if any, should be done in a manner that takes conscious consumerism into account to avoid creating more waste overall.

What would incentivize students to start using reusable utensils?

Frequency of key terms mentioned by survey respondents

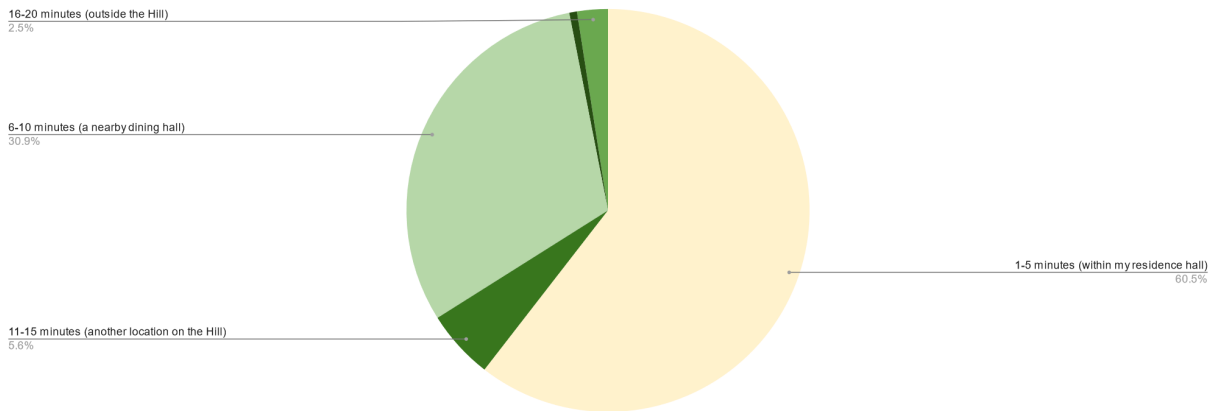


With regard to reusable clamshells, a majority of survey respondents, 54.3%, preferred a reusable clamshell design with three compartments, as opposed to just one or two compartments. When asked to rank certain obstacles in terms of how much they would affect willingness to use reusable clamshells (1 = more important; 3 = less important) students ranked “inconvenience of retrieving or returning reusable clamshells” as the most significant obstacle, with an average ranking of 1.82 out of 3. This was followed by “cleanliness” (with an average ranking of 1.90 out of 3); and “high cost” was the least significant concern, with an average ranking of 2.24 out of 3.

Similar to reusable utensils, a majority (75.3%) preferred that a reusable clamshells program be opt-in as opposed to mandatory. A greater share of survey respondents preferred an opt-in reusable clamshells program than for reusable utensils.

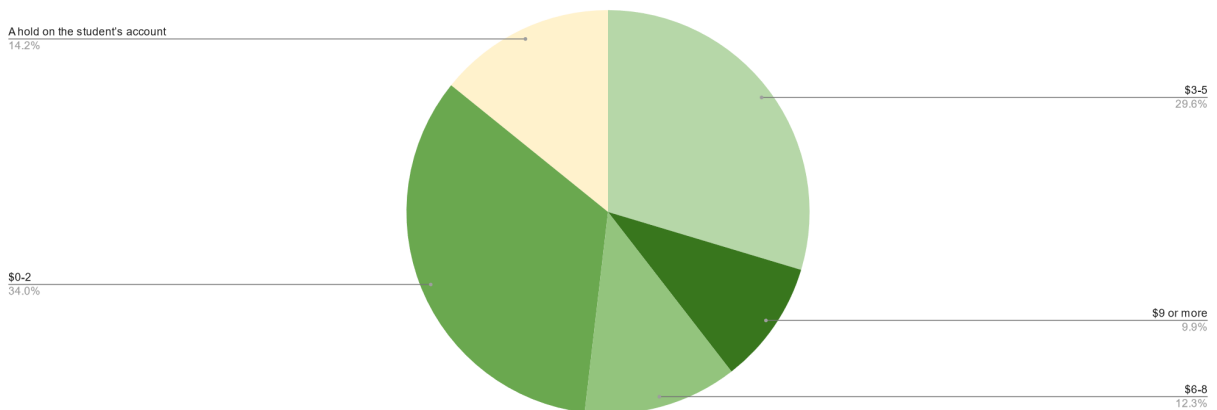
A majority, 60.5%, indicated they preferred reusable clamshell collection points to be located within less than 5 minutes of walking distance (or within their residence hall). 30.9% of respondents indicated their willingness to walk 6-10 minutes to return reusable clamshells, or at a nearby dining hall. Thus, collection points should be placed at locations, including residence halls and dining halls, that minimize walking distance for students.

Clamshells: How long are you willing to walk to return a reusable clamshell?



Finally, respondents were asked *“What suggested monetary deposit amount will encourage students to return used clamshells instead of forfeiting the deposit?”*. 34% wanted a deposit to be less than \$2, 29.6% answered \$3 to \$5, and 12.3% answered \$6 to \$8. Just 9.9% responded with “\$9 or more”, and an additional 14.2% recommended placing a hold on the student’s account to incentivize clamshell return.

Clamshells: What suggested monetary deposit amount will encourage students to return used clamshells instead of forfeiting the deposit?



Pilot Program Exit Survey

Our exit survey yielded information on how pilot program participants felt towards the use of the reusable utensils provided. Of the 28 respondents, 24 picked up and used their utensils to varying degrees, while four did not pick up their utensils. Hence, the following results are

based on the 24 respondents. 82.14% of respondents reported using reusable utensils for half or more of their meals, which aligns with the 78.7% obtained from the main survey when they were asked about projected usage. In comparison, 39.29% of respondents reported using disposable utensils for half or more of their meals. Moreover, 50.00% of respondents reported that they would continue regular use of their newly acquired utensils.

In terms of their usage experience, 64.29% of respondents found the reusable utensils around the same or easier to use compared to disposable utensils. 75.00% of respondents were comfortable using existing facilities to wash their reusable utensils, which was comparable to the 82.7% obtained from the main survey when respondents were asked but still noted that the size of the dorm sinks and lack of washing equipment, such as a sponge and dish soap, was a downside. Respondents also noted that they sometimes forgot to wash their utensils, and strongly suggested providing an easy-to-wash case to keep reusable utensils (compared to the existing ones which are made of cloth). On the whole, respondents were hoping for the process to be made as convenient as possible to incentivize takeup. Several respondents appreciated that both the bamboo and metal utensils were made of sturdy material, but felt that the design of the bamboo fork and knife made them difficult to use. Numerous respondents also enjoyed knowing that they were reducing waste.

Of the four students who did not pick up their reusable utensils but completed the exit survey, they cited busy midterm schedules as obstacles, and suggested having the utensils delivered to the residential halls going forward (although this was not possible for our pilot due to COVID-19 restrictions on the Hill). One sustainability-minded student also suggested that we survey students whether or not they already had reusable utensils before giving them a set.

Although the sample size was fairly small (n = 24) and may have faced overrepresentation of sustainability-minded students since students had to take initiative to pick up the utensils, the results suggest that a reusable utensils program may be extremely promising when scaled up to the whole Hill. We suggest conducting another pilot program with a larger sample size to ensure the replicability of our results.

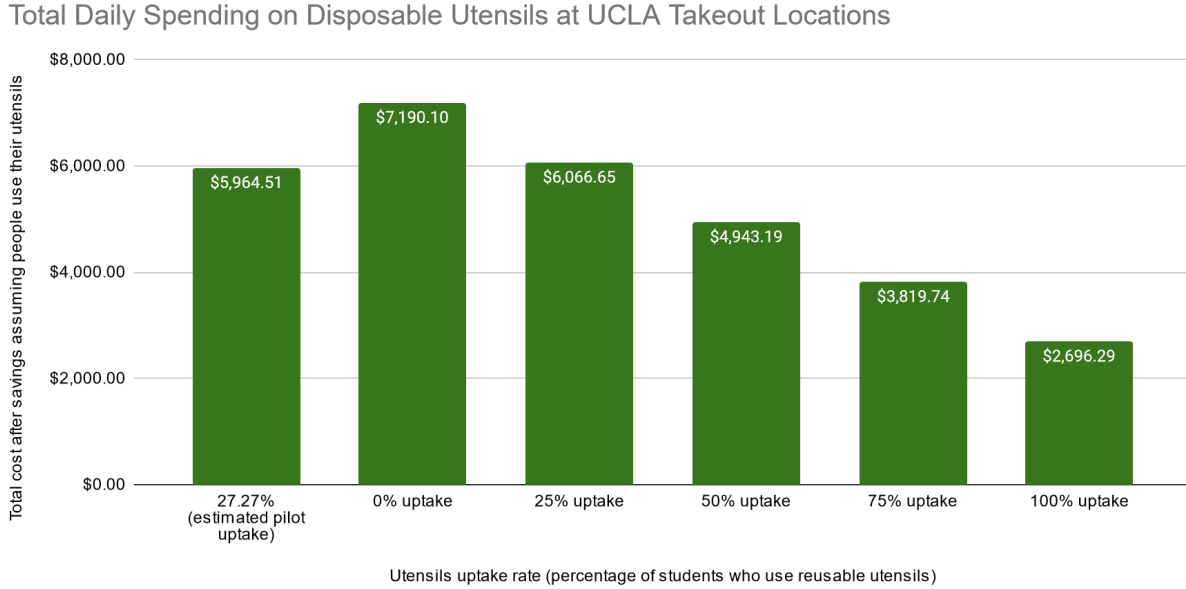
Financial Analysis

We estimated the daily spending on disposable utensils to be \$7,190.10 per day. This was calculated based on the assumption that there are 15,978 customers at takeout locations each day, with each customer using one set of disposable utensils costing \$0.45 per set. The number of disposable utensil sets saved each day was estimated based on various uptake rates and the usage patterns reported by pilot program participants in the exit survey. These quantities were then multiplied by \$0.45 to obtain the daily cost savings from the reduction in disposable utensils (Table 1).

The daily cost savings from the reduction of disposable utensils were \$0, \$1,123.45, \$2,246.91, \$3,370.36, \$4,493.81, and \$1,225.59, which correspond to 0%, 25%, 50%, 75%, 100%, and 27.27% uptake rates respectively. In addition, the total cost after savings were calculated to be \$7,190.10, \$6,066.65, \$4,943.19, \$3,819.74, \$2,696.29, and \$5,964.51. Even a 100% uptake rate would not completely eliminate the need for disposable utensils since usage patterns predict that students will continue to use disposable utensils some of the time.

Daily Cost and Savings	27.27% uptake (estimated pilot program uptake)	0% uptake	25% uptake	50% uptake	75% uptake	100% uptake
Total utensils saved	2723.522727	0	2496.5625	4993.125	7489.6875	9986.25
Total \$ saved in a day	\$1,225.59	\$0.00	\$1,123.45	\$2,246.91	\$3,370.36	\$4,493.81
Total daily cost	\$7,190.10	\$7,190.10	\$7,190.10	\$7,190.10	\$7,190.10	\$7,190.10
Total cost after savings assuming people use their utensils	\$5,964.51	\$7,190.10	\$6,066.65	\$4,943.19	\$3,819.74	\$2,696.29

Table 1. Projected daily costs and savings from reusables program



To obtain yearly estimates for costs and savings, we multiplied the amounts for daily cost and savings by 180 days per year. We then added the fixed cost of purchasing 12,000 metal utensil sets, estimated at one set for each student living on the Hill, at \$3.29 each from this amount, and subtracted the amount saved from the yearly cost savings from the reduction of disposable utensils, to obtain estimates for final yearly costs after reusable utensils are implemented.

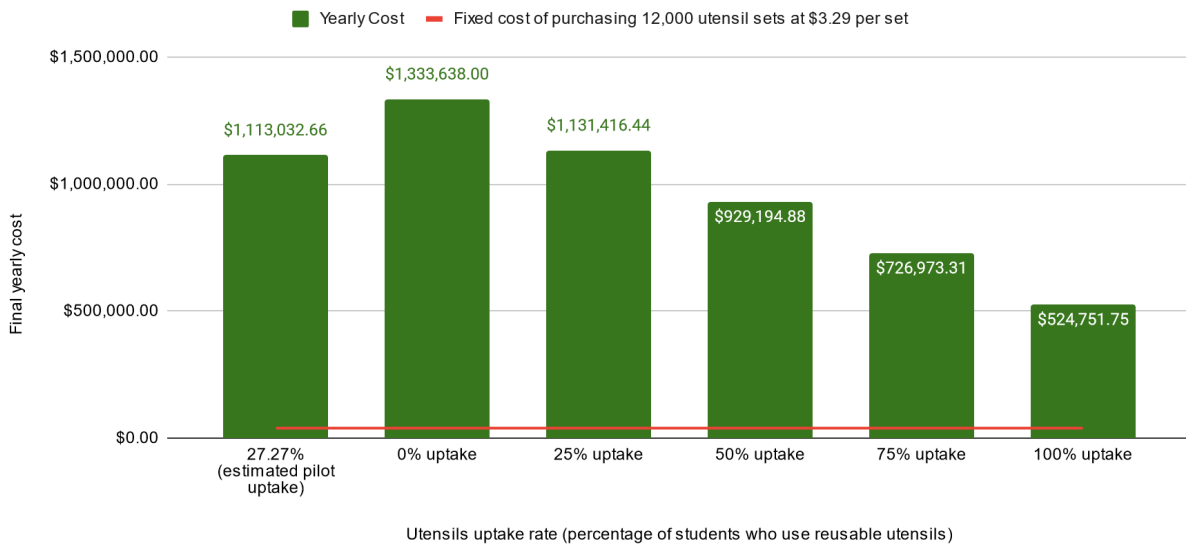
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Yearly Cost and Savings	27.27%	0% uptake	25% uptake	50% uptake	75% uptake	100% uptake

(180 days/year)	(pilot uptake)					
Total yearly cost before savings	\$1,294,218.00	\$1,294,218.00	\$1,294,218.00	\$1,294,218.00	\$1,294,218.00	\$1,294,218.00
Fixed cost of purchasing X number of utensil sets	\$39,420.00	\$39,420.00	\$39,420.00	\$39,420.00	\$39,420.00	\$39,420.00
Miscellaneous costs (ie: detergent, signage)						
Total saved from reduction in disposable utensils	-\$220,605.34	\$0.00	-\$202,221.56	-\$404,443.13	-\$606,664.69	-\$808,886.25
Final yearly cost	\$1,113,032.66	\$1,333,638.00	\$1,131,416.44	\$929,194.88	\$726,973.31	\$524,751.75

Table 2. Projected yearly costs and savings from reusables program

Total Yearly Spending on Disposable Utensils at Takeout Locations



According to calculations of the break-even rate, 87,600 disposable sets need to be reduced yearly to break even. If 12,000 utensil sets are purchased at \$3.29 per set, each person would need to use their sets 7.3 times per year for the cost of purchasing reusable utensils to equal the savings from the reduction of reusable utensils.

	Break-Even Rate	Assumes 1 reusable set per resident per year at \$0.45 per set	
	Total spending on reusables (auto calculated)	# of disposable sets that need to be reduced to break even	# of disposable sets used at break-even rate
Yearly	\$39,420.00	87,600	2,788,440

Daily		487	15978	15491
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Table 3. Yearly and daily break-even rates.

Discussion

Based on the results of our informational interviews, focus group, pilot program, and surveys, we created a list of recommendations for UCLA Dining to eliminate single-use utensils and containers on The Hill.

Utensils

To ensure the success of a reusable utensils program, we created an implementation plan with specific recommendations for the purchase of materials and program marketing.

Firstly, we recommend that UCLA Dining purchase metal reusable utensil sets, including a metal straw and chopsticks. If budget allows, the pouches holding the utensil sets should be UCLA-branded to cultivate hype and to tie the program to the credibility of UCLA as an institution and as a champion of sustainability. Utensil sets should be distributed free of charge with a small sponge for cleaning, and portable wash stations should be placed outside of boutique restaurants and dining halls so that students can rinse soiled utensils before storing them in their backpacks. These wash stations need not be equipped with dish soap, although this provision may improve the program’s perceived credibility among students. Lastly, Dining should purchase as many utensil sets as there are undergraduate residents on The Hill since any rate of uptake over 0% would result in annual savings as long as students use their utensils a certain number of times (Table 1). Additionally, total yearly savings increases with rate of uptake, so with proper marketing, a high uptake and thus a high cost savings is possible.

To best market reusable utensils, we recommend making the program optional for students but inconvenient to opt out of. This might take the form of boutique restaurants having single-use utensils on hand, but these utensils are made from a flimsy wood material and only

available upon request. We also recommend that UCLA Dining pursue a marketing campaign that encourages students to use their reusable utensils. Marketing tools may include posters that display the volume of waste diverted from landfill, the amount of emissions saved by eliminating transport of single-use utensils to the UCLA campus, etc. This marketing campaign, however, must keep accessibility in mind since not all students are able to wash their own utensils. The campaign may also serve to remind students to bring their utensils with them when ordering a meal from a boutique restaurant and to wash their utensils when finished. These reminder posters should be displayed throughout The Hill, for example, on dorm elevators.

As for clamshells more specifically, a lot of work is still to be done in adapting a circular system on The Hill. Encouraging students to return clamshells is of highest priority according to accounts of other program success. If UCLA were to implement a financial buy-in for the program, a \$5 or greater buy-in would be the most likely way to encourage substantial clamshell return from students. However, this option does impose a financial burden on students and could limit accessibility to the program. A lower financial buy-in would lessen burden to students but the program would need to be supplemented with significant student outreach or positive incentives to avoid clamshell build-up. From all stages of data collection, it became increasingly clear that convenience to students may be the greatest determining factor to student participation. For our purposes, this means highly prioritizing a greater number of clamshell drop-off locations in locations closest to student activity (dorms and boutique restaurants). The data indicates that students are unlikely to expend any extra effort to return clamshells.

It is likely that implementing a program as novel and complicated as a circular clamshells program will run into many challenges along the way. For this reason we strongly encourage continued data collection as programs are implemented. We found focus groups provided the

highest potential for detailed, nuanced opinions and ideas to arise within a short time period. Additionally, it is important to acknowledge that dining employees will be a key component of any program success. From clamshell collection, transportation, cleaning, and distribution, they will be heavily involved and will be expected to seamlessly implement the program from the student's perspective. For this reason, holding small facilitated meetings during existing "mini-meetings" where employees can raise any encountered problems and offer solutions from their perspectives could be a valuable source of information. In this way, dining can remain flexible and open to changes needed when they arise.

Challenges

One major challenge we faced was restricted interactions with pilot program participants due to the COVID-19 pandemic. We initially planned to distribute utensil sets directly to individual participants, but due to new health protocols on The Hill, participants were required to pick up their own utensil sets from the De Neve front desk which required additional effort on the part of participants who did not live in De Neve Plaza. This obstacle may have decreased our rate of uptake such that it does not represent the post-COVID uptake when utensils would be given directly to students. In addition, it may have skewed our survey results since the students who did participate in the pilot program were potentially more predisposed to use reusable utensils than their peers.

We faced additional challenges in both the rollout and analysis of our surveys. In our initial Hill-wide survey, we did not require students to sign in with their UCLA email address, nor did we implement a CAPTCHA to filter out bot responses. As a result, approximately 2/3 of the responses from our initial survey rollout were from bots, not actual UCLA students. We later implemented a CAPTCHA and required survey-takers to sign in with their UCLA email address,

and we were able to eliminate bot responses. In analyzing survey responses, we found that a majority of students preferred that the reusables programs be opt-in rather than mandatory. We also found that if we were to charge a deposit each time students checked out a reusable container, students would prefer a deposit between \$0 and \$5. These two suggestions, although they represent student opinion, may be too lax to effectively reduce single-use utensil consumption or encourage reusable container return. We ran into a similar issue for a question that asked students to rank which motivational factors were the most important to them in influencing their choice to use reusables. Although students self-reported peer and societal pressure to have low influence over their choice of using reusable dining ware, these factors may have a subconscious effect that may not be perceived by students.

Finally, we experienced difficulties in providing incentives to pilot program participants and survey-takers due to slowdowns in The Green Initiative Fund (TGIF) office. If this project was to be repeated, it would be best to apply for funding as early in the process as possible.

Based on our findings, there is great potential for reusables on the UCLA campus. Students appear willing to adapt to behavioral changes and the financial data indicates a great potential for savings. However, much work still remains to be done before these projects become a reality. Moving forwards, the greatest work to be done is adapting to the existing residential infrastructure on the Hill. A utensils program should be a relatively straightforward endeavor because after utensils procurement and distribution, usage will be in the complete control of students. Of greater priority will be the tailoring of a reusables clamshells to the Hill, prioritizing, student convenience, drop-off locations, transportation to dishwashing facilities, and eventual relocation to boutique restaurants for redistribution to students. However, with proper training and data collections, we are fully confident that these programs can be successful at UCLA.

Appendix

Item A: Winter Quarter Focus Group Questions

1. First, we wanted to gauge students' opinions for what they believe makes for a good UCLA Dining experience. Please walk us through what you prioritize when judging that decision.
 - Prompt: What do you like so far about the way UCLA Dining operates on the Hill? What do you not like?
 - Probe:
 - What do you wish was different about UCLA Dining?
 - Specifically, what are your pros and cons for the UCLA dining halls vs. the UCLA boutique restaurants (Cafe 1919, Rendezvous, Bruin Cafe, The Study, etc.)
 - How important is UCLA Dining to your experience on the Hill and at UCLA?
 - What are your deal breakers when it comes to a "bad dining experience"?
2. Compare and Contrast: UCLA Takeout vs. UCLA Dine-In. Why do students prefer one over the other?
 - Extra Tools: Zoom Whiteboard
 - UCLA Takeout: Pros and Cons
 - UCLA Dine-In: Pros and Cons
 - Prompt: How often do you find yourself going to a dining hall vs. getting takeout from a boutique restaurant (ex: The Study)?
 - Probe:
 - What is the purpose of getting takeout for students (food, convenience, saving for later)?
 - Where do people consume their takeout items (in the eatery itself, outside, in the dorms)?
 - How likely would students eat dine-in at a takeout restaurant if offered that option?
3. To what extent do you think students on the Hill value sustainability, and why?
 - Extra Tools: Poll (1-10 Likert Scale)
 - Prompt: Do you value sustainability on the Hill?
 - Probe:
 - What do you think are the challenges in incorporating sustainability into everyday life?

- Are there specific situations where you've noticed UCLA students taking extra effort to care about sustainability or don't care about sustainability at all?
 - Considering UCLA Dining specifically, where do you think there is room for improvement?
4. What would you be willing to change about your dining experience to make UCLA more sustainable?
- Prompt: What are current areas you can identify about your dining practices that are not considered sustainable that you would like to improve?
 - Probe:
 - How can UCLA make that transition easier for you?
 - What are your thoughts on BYO (Bring Your Own), reusable containers/utensils, or compostable alternatives in general?
5. Are you familiar with the UCLA Plastic Policy? What do you believe are the most prominent barriers in eliminating single-use plastics/non-reusables in campus dining?
- Extra Tools/Prompt: The UCLA Plastic Policy is aiming to eliminate all single-use plastics used on the Hill. That means takeout containers and utensils. Now that you're familiar with the basic premise of the policy, *repeat above question*
 - Prompt: Why do you think students continue to use single-use plastics or non-reusables, despite knowing their environmental impact?
 - Probe:
 - What factors do students consider when judging the usage of single-use containers and utensils?
 - What do you like most about UCLA takeout packaging?
 - Where do you think there is room for change?
6. Situation: UCLA gets rid of all single-use utensils. What would your reaction to this be? What would you do?
- Probe:
 - How resistant do you think UCLA students would be to change?
 - If UCLA were to get rid of single use plastic in one area (cups, utensils, bowls/takeout containers), which do you think would be most feasible and widely accepted?
7. Are there any other measures you think could/should be taken to make UCLA dining more sustainable that haven't been mentioned?

Item B: UCLA Dining Survey Questions

Part 1: Demographics

Name

Major/minor
Year
Current Residence
Meal Frequency
Meal Plan
Living on the Hill next year

Part 2: General Sustainability Questions

How important is sustainability to you?
How important is sustainability to the general UCLA population?
What reusable items do you currently use?
Rank importance of reusable products in terms of...
 Money saved, time saved, convenience, peer/societal pressure, environment
What aspects of packaging from UCLA takeout restaurants are important to you?

Part 3: Utensils

Rank reusable utensils: metal, bamboo, durable plastic
How often would you use reusable utensils?
Would you prefer a mandatory or opt-in program?
What would incentivize students to use reusable utensils?

Part 4: Clamshells

Which clamshell design do you prefer - various compartments?
Rank obstacles in terms of how they would affect willingness to use reusable clamshells
 Cost, cleanliness, convenience
Would you prefer a mandatory or opt-in program?
How long are you willing to walk to return a clamshell?
What monetary deposit would encourage students to return clamshells?

Item C: Pilot Program Exit Survey

Part 1: Demographics

Name
Email
Residence Floor
Did you participate in the program?

Part 2: For those who did not participate in pilot program

Did you want a reusable utensil set?
Which set of utensils would you prefer - metal, bamboo, durable plastic?

What prevented you from picking up utensils?

What could the program have done to incentivize you to participate?

Part 3: For pilot program participants

What utensil material did you use?

Which set of utensils would you prefer - metal, bamboo, durable plastic?

How did reusable utensil sets compare to disposable utensils

How often did you use the utensils?

How many meals throughout the program did you use disposable utensils?

Was your usage of reusable utensils decreasing or increasing with time?

Would you prefer a mandatory or opt-in program?

Were you comfortable washing the utensils in your living environment?

What are some positive aspects of your experience with reusable utensils?

What are some negative aspects of your experience with reusable utensils?

How willing are you to continue using reusable utensils?

References

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All other materials can be accessed from the attached folder, archiving all other elements of our data collection.