



Plastic Policy Implementation Final Report

Assessment of Cost Implications and Student Reactions Towards Fiber-Based Disposable Utensils in UCLA Dining

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Abstract

The goal of the Plastic Policy Implementation team is to assist UCLA Dining in implementing the UCLA Single-Use Plastics Policy. The policy establishes a target to eliminate disposable single-use plastic foodware accessory items with reusables or locally compostable alternatives for all foodservice facilities, meetings, and events. The utensils currently used at UCLA Dining are made of polylactic acid (PLA) which is no longer compostable by Athens Services, UCLA's waste hauler. Therefore, these utensils are not compliant with the Single-Use Plastics Policy. Through our research, we will be assessing the cost implications and student reactions to a transition to fiber-based disposable utensils (made of either wood or bamboo) which are compliant with the policy. Using UCLA Dining purchasing data, we compared the cost per piece of currently used PLA disposable utensils to fiber-based disposable utensils, and obtained purchasing costs for Fall 2021 and Winter 2022. We gathered student feedback on three utensil options through surveys conducted outside Rendezvous, a UCLA Dining location. We found fiber-based disposable utensils to be a feasible option to replace PLA disposable utensils, both in terms of cost and student preference.

Introduction

The California Recycling and Plastic Pollution Reduction Act of 2020 has noted that global plastic production is estimated to at least triple by 2050 (DeShazo, 2020), while only 9% of plastic produced has been recycled (Geyer et al., 2017). Plastic usually ends up in landfills or oceans and every year, 8 million tons of plastic enters the oceans, polluting marine environments and endangering marine ecosystems. Half of all plastic waste is single-use (Beat Plastic Pollution) and disposable single-use foodware items such as utensils are significant contributors. The likelihood of plastic actually being recycled is often determined by the economic viability, sorting processes, contamination, and material properties (DeShazo, 2020). Foodware is often contaminated and as a result is not processed in many facilities. Currently, no recycling or materials recovery facility (MRF) recycles single-use plastic foodware in LA County. Thus, transitioning away from single-use disposable plastic foodware is essential and aligns with LA's OurCounty Sustainability Plan Action 107 which calls for development of an equitable strategy to phase out single-use plastics (DeShazo, 2020). The University of California campuses including UCLA have made the commitment to be plastic free by 2023, and in 2020, UCLA's Single-Use Plastics Policy was instituted. Under the policy, by January 1, 2021, all foodservice locations were to comply with the policy and ensure they are using reusable or locally compostable foodservice accessory items (which includes utensils) (UCLA Policy 809: Single-Use Plastics). Currently UCLA Dining locations offer single-use utensils made of polylactic acid (PLA). PLA is a bioplastic which means that it is made from plant-based materials, but has been processed to possess the properties of plastic. PLA is no longer compostable at facilities of UCLA's waste hauler, Athens Services, because it takes too long to break down, thereby contaminating the rest of the compost. PLA does not classify as locally compostable. Thus, UCLA Dining is not currently complying with the Single-Use Plastics Policy.

The 2021 Sustainability Action Research Plastic Policy Implementation Team researched the feasibility of implementing reusable utensils and found that while there is great potential for implementing reusable utensil on campus, there are infrastructural barriers such as challenges with creating utensil drop off location and transportation to facilities for dishwashing (Chiu et al., 2021). In addition to existing challenges, COVID-19 related staffing shortages have also arisen, exacerbating difficulties with washing reusables. Another compliant alternative under the UCLA Single-Use Plastics Policy is fiber-based disposables. Thus, the focus of the 2022 Plastic Policy Implementation Team is to facilitate the transition to fiber-based disposable utensils which are compliant with the policy in UCLA Dining. This was done through the research question **"What are the cost implications and student reactions of implementing fiber-based disposable utensils in UCLA Dining that are compliant with the UCLA Single-Use Plastics Policy?".** We aimed to answer this question by finding information on variables which are extremely important in UCLA Dining's purchasing decisions: cost and student preference. This was accomplished through a cost analysis and student feedback survey, the results of which were communicated to UCLA Dining in a concise informational document.

Methods

We spent the majority of our time gathering preliminary information for our test project regarding UCLA Dining's purchasing trends, conducting market research, and analyzing utensil alternatives. We laid out our plan to research what types of utensils we would want to conduct a cost analysis for and also gather student feedback for. The first step for this process was to get in touch with UCLA Dining management and gain knowledge about the current vendors for UCLA. Our stakeholder, Denita Toneva, got us in touch with the account manager for one of UCLA's vendors – Individual Food Service (IFS). The account manager was able to get us some of the purchasing reports from the Fall and Winter quarter of 2021-22. The reason why we only used Fall and Winter quarter purchasing reports was because there was a huge decline in utensil usage during the pandemic, which would have led to skewed data. We also could not use data from prior to the pandemic because IFS had a change in management and the past data was no longer available.

With the purchasing data that was available to us, we pulled out just the data for the utensils that UCLA Dining had purchased throughout the Fall and Winter quarters of 2021-22. Then, we calculated the number of each type of utensil that they were purchasing each month. Finally, we calculated the average price UCLA Dining was paying per unit. Calculating this information was important because we were able to compare the cost per unit of the fiber-based disposable utensils that we purchased with the currently used PLA disposable utensils.

Furthermore, we took some time to research the options for fiber-based utensils that are already readily available to us. We then looked into private companies that sell fiberbased utensils and created a spreadsheet with information for each option regarding cost, minimum purchase amount, material, contact, and catalog information. We compared the cost of each option to help us narrow down the options from the list of possible suppliers while allowing us to see which options would actually be feasible for our project. By weeding out the options we thought were not feasible due to either price or compliance with the Single-Use Plastics Policy due to material, we chose three fiber-based utensil companies that met the criteria of being fiber-based and that were sold in large quantities. These brands were also selected because there were supply shortages at the time that left us with few only a few brands that met our criteria. The companies that we chose were WoodAble, Concession Essentials, and Bamboo by EcoChoice. From the company WoodAble, we purchased a set of 100 each of their spoons, knives, and forks. For Concession Essentials, we purchased a set of 100 spoons and 100 forks. And for Bamboo by EcoChoice, we ordered 100 sets of their pre-packaged sets that have a spoon, fork, and knife all together in a bundle. To purchase these fiber-based disposables, we applied to the The Green Initiative Fund and were able to purchase them from online vendors.

During the Spring quarter, we began to plan out how to get student feedback and compare the prices of the current PLA utensils being used by UCLA Dining and the new fiber-based utensils we chose. After collecting the three brands of utensils we ordered, we decided that the best way to get unbiased student feedback was to distribute utensils outside of one of UCLA's take-out locations. We chose to distribute our utensils in front of Rendezvous because it is a take-out location that is often frequented by students. We distributed the utensils to students at Rendezvous on the days May 4 and 5, 2022 from 11am to 3pm. We chose the times 11am to 3pm because that was during lunch hours, and we wanted to get as much feedback as we could in a concise amount of time. Along with distributing utensils, we also created a Google form that the participants would fill out once they had tried using the utensils. The Google form had questions that prompted students on their honest feedback (refer to Appendix).

While distributing the three brands of utensils that we acquired, we made sure to label each individual utensil with the first letter of the brand that they were given. For example, if a student chose to use a fork that was from the brand, Concession Essentials, the fork would have a C on it. This step was necessary because when the student would fill out the feedback survey, they could tell us which utensil they used. Along with that, while passing out the utensils to students at Rendezvous, we made sure to alternate between passing out the different utensil brands in order to receive sufficient feedback for all three utensil brands. We also made sure to keep equity, diversity and inclusion (EDI) at the forefront of this project by ensuring that we were passing our utensils to a diverse set of students to avoid cherry-picking our participants. This ensured that we were getting honest feedback from students of different backgrounds and gaining various perspectives on this initiative. Additionally, our project kept in mind future accessibility for students by ensuring these costs would not be borne by students – thus we analyzed costs to ensure it was comparable to what is currently being used and can be implemented without financial burdens on students.

Challenges

Our team faced several challenges during our research of fiber-based disposable utensils. The first issue was the change of our stakeholder to Sustainability Analyst, Denita Toneva, from Erin Fabris, who served as the Sustainability Manager for UCLA Housing and Hospitality for four years. Due to this change we did not have immediate access to many of the connections that Erin had formed at UCLA Dining.

Another issue we faced was the lack of utensil options that fit within the UCLA Single-Use Plastics Policy. For example, UCLA Dining advised us to avoid utensils consisting of PLA and bamboo due to bamboo's limited inability to cut through hard food such as meat. This limited our options as we struggled to find fiber-based utensils that were not made of bamboo, and we ultimately had to solve this by finding bamboo options that did appear durable. Many vendors we contacted also lacked enough supply for a bulk order or were out of stock of many of the cutlery kits we were interested in.

Furthermore, our team did not have a reliable set of data to analyze for UCLA Dining purchase records. Many of the pre-pandemic data were either deleted or missing. Thus, we had to rely on analyzing data during this year's Fall and Winter quarter, which is difficult to use as it is not represented as normal data due to factors such as less students living in UCLA's dorms as well as the frequent dining hall closures. In addition, the Winter quarter data especially showed higher variability than typical data as classes had transitioned online due to the surge of the pandemic.

We also faced challenges during our data collection. Students in Rendezvous East wished to use chopsticks instead of our utensils, and many food items in Rendezvous West did not require usage of utensils. The special food items, for example, the California steak burrito, being served during our period of data collection also did not require utensils. Thus, data collection was less efficient than we expected.

To overcome these challenges, our team learned about the importance of maintaining frequent communication with our stakeholder and bringing up issues in a timely fashion. By constantly being in communication, our stakeholder was able to acquire some missing data that UCLA Dining lacked by contacting other administrative officials such as the account manager for UCLA at IFS. We were also able to procure more wood options by contacting IFS, who are currently also working on researching fiber-based options to present to UCLA Dining management. Finally, our team decided to analyze data from Fall and Winter 2021-22 data in our research project due to the lack of data from past years. While this may not reflect the pre-COVID-19 UCLA Dining purchasing trends at UCLA, our team agreed that this time period was the most reliable data we can use to base our cost-benefit analysis off of. Despite these challenges we faced, our team learned that consistent communication and consultation with administrative officials in UCLA Dining are two ways we can move forward in our mission to eliminate single-use plastics in UCLA Dining.

Results

Utensil Feedback

Our results consisted of data from a cost analysis of the different utensil brands and responses from our student feedback survey. The purpose of the survey was to determine the opinions of students currently living on the Hill.



Our survey included several introduction questions, such as name, major, and email, that we did not choose to represent in our final conclusions, but to oversee the overall representation of the students to ensure a lack of bias. After reviewing the responses, there appears to be a diverse selection of majors of students that responded to our survey, which indicates that there was not a certain major that would possibly have more knowledge on the subjects of our study that would possibly sway their survey responses on the quality of the utensils. Despite there being a majority of students that responded that they are majoring in a science related subject, there was still a large variation amongst the different categories to reflect the responses from the departments at UCLA. How familiar are you with the UCLA Single Use Plastics Policy? 136 responses



To assess pre-existing awareness of the UCLA Single-Use Plastics Policy, we asked students "How familiar are you with the UCLA Single-Use Plastics Policy?" to which the respondents answered with different levels of familiarity. As seen in the pie chart, the majority of the respondents reported that they were vaguely familiar (44.9%) or haven't heard of the policy at all (46.3%). Since most participants are unfamiliar with the policy, it limits the bias of those who are familiar with the policy and may use that knowledge about the current condition of plastics and bioplastics used on campus and how they are not compliant with the policy to review the disposables we offered. Our study preferred students who were unaware of the situation as they could give accurate unbiased feedback of what they thought of the utensil without being swayed by a bias towards a certain brand or type.



125 responses

Which brand of utensils did you receive ?

This graph displays the distribution of utensils by brand to each respondent as in our methodology we aimed to maintain consistency and validity. As is seen by the pie chart, the different utensil brands were given out fairly evenly with 30.4% responses from the Concession Essentials (C), 31.2% from the WoodAble (W) utensils, and 38.4% from Bamboo by EcoChoice (B). This provides an appropriate context to base our conclusions.



The graph above represents our results that are essential to fulfilling the purpose of our study. It shows the average overall rating and average durability rating of the utensils of the different brands and types. As the graph demonstrates by the blue bar, the average overall rating when ranked on a scale of 1-5 is around 4, with the lowest ranking being 4 and the highest being 4.4. Durability appears to be ranked slightly higher in a majority of the options with the highest rating being 4.5. This provides promising results for our study's final conclusions as it reflects that the disposable utensils offered to the students were generally liked across the different variations offered.

Which of these options would you prefer the most?

136 responses



The final graph is essential to the final conclusions of the study as it addresses the question of student preference. The results indicate that the new disposable utensils we offered were favored by the majority of participants with 49.3%, followed by personal reusable utensils with 27.9%, and finally the currently used disposable utensils with 22.8%. These are very promising results for our final conclusions as the chart shows that half of the students surveyed preferred the utensils we gave them over the current ones distributed on the Hill. The rest of the data was split between the current and the personal reusable utensils that are yet to be implemented, with a slight favoritism towards the personal reusables. The results of this survey question can be very significant for the future of sustainability on the Hill as we can push more for change with UCLA Dining administration with the support of the students.

Cost Analysis



The graph above was constructed using the supplied data from IFS, UCLA Dining's vendor. This graph was produced by filtering the original sheet to only include the disposable utensils and then further sorted into each utensil type (fork, spoon, and knife). The utensils of each category were put together for each month and displayed in the bar graph above. The graph contains the total number of disposable utensils of each type for the months from October 2021 through March 2022 (roughly the UCLA Fall and Winter Quarters). The reason why only these months were used is because the pandemic forced students to be entirely virtual for a period of 1–2 years before these months. The pandemic did not allow for a good estimate of what standard operating time purchases would look like.

From the graph, it can be seen that there are more utensils purchased overall in the Winter Quarter months (January 2022 – March 2022) than in the Fall Quarter months (October 2021 – December 2021). This is likely due to the pandemic still influencing the decision for many students to remain remote as many classes were offered entirely virtual in the Fall Quarter.

The most commonly bought utensil type were forks (blue column). The forks were bought in a much higher quantity than the spoons (red column) and the knives (orange column). Therefore, the forks are the most important utensil to take into account when looking at both student feedback and cost analysis. Another interesting point is the sheer number of utensils purchased per month. For example, the fork purchases are nearly 300,000 in just one month (for January). This is a point to consider when analyzing the feasibility of the utensils used in this study as the prices for the disposables used by UCLA are likely influenced by the bulk purchase while the utensils purchased for this study were several magnitudes lower (packs of 100).



Per Unit Utensil Prices By Brand

This is the second graph produced using the data provided by IFS. This graph has the per unit utensil prices by the brand of utensil used. For the fiber-based utensils, the brands are the Bamboo by EcoChoice, Concession Essentials, and Woodable. The currently used utensil prices were found by taking the average cost paid by UCLA Dining across the 6 month study period. Taking the average was the best way to get a value to compare the prices of the fiber-based utensils to the PLA utensils. It can be seen in the graph that the Concession Essentials brand has a unit price for the fork (blue column) and spoon (red column) but not the unit price for the knife (orange column). This is

because there was a shortage of utensils available in general due to the pandemic and the Concession Essentials knives were not in stock. However, since there were two out of the three utensil types in stock, specifically the forks which are the most used utensil type (as seen in the previous graph), we decided to include the Concession Essentials utensils in the study.

It is shown in the graph that the prices of the fiber-based utensils are competitive with the utensils that are currently used by UCLA Dining as they are generally only a few cents off per unit of utensil. In particular, the Concession Essentials utensils are very competitive as the per unit price of the forks are \$0.09 which is the same as the average of the currently used utensils which are also at \$0.09. In fact, the per unit price of the spoons is cheaper for fiber based disposables at \$0.06 while it is \$0.08 for currently used PLA disposables. As seen in the survey graphs, there was low variability in the average overall and durability ratings between the various fiber-based utensil brands. Additionally, as the overall grades were all relatively high (rated about 4 out of 5) and with the majority of students voting for the fiber-based utensils over the currently used disposables or personal reusables options, the Concession Essentials, with its highly competitive price and high rating, can be seen as a good alternative for the currently used disposables that are not in compliance with the UCLA Single-Use Plastics Policy.

It should also be noted that the per unit prices of the fiber-based utensils are based on "small" purchases of around 100 per utensil type. Compared to the monthly purchases made by UCLA Dining which can number between around 100,000 to 300,000 per utensil type, there are likely reductions in per unit price due to the bulk purchases. Therefore, the prices of the fiber-based utensils could be even more competitive if purchased in such large quantities. With more research being done on how bulk purchases influence the per unit prices of the fiber-based utensils, more options can be feasible alternatives for the currently used disposable utensils in UCLA Dining locations.

Discussion

The results from our project indicate that transitioning to fiber-based utensils is feasible, both in terms of cost and student preference. Additionally, students overwhelmingly want more sustainable alternatives to the PLA utensils that UCLA Dining currently uses. In regards to sustainability on the UCLA campus, switching to fiber-based cutlery on the Hill has the ability to not only help our campus become compliant with the Single-Use Plastics Policy, but also helps decrease the amount of waste sent to landfill. Fiber-based utensils can be composted unlike PLA utensils which diverts our waste away from landfills. This process also aids UCLA in the UC wide effort to achieve 90% waste diversion from landfill.

Additionally, our project lays the groundwork for future SAR teams to expand upon our efforts. For example, future teams can look into replacing other non-policy compliant items on the Hill with fiber-based alternatives. As national demand for these types of products increases, more options will appear on the market and future teams can analyze these options and see which brand or supplier would be right for UCLA. Additionally, because these products have the ability to be utilized in all campus eateries, and not just the Hill, future SAR teams could work with ASUCLA on implementing similar initiatives in ASUCLA restaurants and locations on campus. Further researching a reusable utensil program is another possible avenue of future research, as 27.9% students who participated in our survey indicated they would be willing to use personal reusable utensils. The SAR 2021 Plastic Policy Implementation team already has an implementation plan with specific recommendations for vendors and marketing which would be immensely helpful in kick starting this program in future years (Chiu, et.al, 2021). In addition, through the process of our cost analysis we were able to obtain data regarding UCLA Dining's actual purchasing cost, which could be used to do more valid cost analysis for reusables as well as payback period calculations. The overwhelmingly positive response towards our fiber-based utensils also highlights the demand and overall satisfaction of these alternative products by the student body. Similar to the Single-Use Plastics Policy, which was enacted through wide student support, our findings can be used as the groundwork for future initiatives to hold UCLA accountable for meeting their zero waste targets.

Our data will help our stakeholder, Denita Toneva, who works in the UCLA Office of Sustainability present fiber-based disposables as a feasible option for events across campus. Our data is also incredibly important for the new UCLA Housing and Hospitality Sustainability Manager who will start at UCLA in Fall 2022. Our informational pamphlet highlights the findings of our project, while educating UCLA Dining management on why these alternatives are needed. This pamphlet includes the data from our survey and supporting literature and is an essential element in pushing the campus towards a more sustainable future. Our findings also highlighted a large gap in student knowledge of the current policy. This is alarming and implies that most of the student body is unfamiliar with campus sustainability efforts, and how those efforts directly affect the environment and the community. Increasing student education about the Single-Use Plastics Policy, and campus sustainability efforts as a whole is important to ensure that UCLA can meet its zero waste targets.

Moving forward, our team would like to see the new Housing and Hospitality Sustainability Manager utilize the information we presented in the pamphlet to make the switch to fiber-based utensils. Beyond utensils, we hope to see more sustainability efforts focused on helping the Hill become compliant with the Single-Use Plastics Policy. These efforts include, but are not limited to: renegotiation of the upcoming contract renewal with Coca-Cola to demand either reusable or locally compostable beverage containers, elimination of all PLA based materials on the Hill, and reusable packaging programs. Specifically, we also hope to see more emphasis placed on figuring out the logistics of implementing systems for reusable clamshell containers and a reusable utensil program such as the OZZI system. Implementing these sustainability efforts will have the profound effect of making UCLA a truly sustainable campus, while also instilling good habits and environmentally conscious ideals into the student body which will have a ripple effect into the community.

Appendix

Feedback Questions asked to students on the Google Form survey:

- 1. What is your major?
- 2. How familiar are you with the UCLA Single Use Plastics Policy?
- 3. Which brand of utensils did you receive ?
- 4. Which utensils did you use?
- 5. Overall rating of the fork (skip if you didn't use this utensil)
- 6. Overall rating of the spoon (skip if you didn't use this utensil)
- 7. Overall rating of the knife (skip if you didn't use this utensil)
- 8. How easy was it to eat with the fork?
- 9. How durable were the utensils?
- 10. Which of these options would you prefer the most?
- 11. Anything else you would like to add about the utensils?

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