

# Reducing Food Plate Waste at the Consumption Level

*Investigating Leading Drivers at the UBC AMS Nest Building*



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## Executive Summary

This research project is in collaboration with the Social Ecological Economic Development Studies (SEEDS) program at the University of British Columbia (UBC) to investigate the key drivers of post-consumer food waste in the Alma Mater Society (AMS) Nest building and propose viable and practical solutions to the issue. Based on a review of pre-existing literature, we distilled three major considerations that frame our research and our methods. We determined that post-consumer food waste tends to occur due to a lack of awareness and knowledge, generally poor quality and quantity of food, and the effect of socio-demographics on one's attitude towards the issue. With these three points in mind, we developed the methods for our research.

Our research made use of a mixed-method approach using mostly qualitative data. The first method we utilized was online surveys which we distributed through call for participation flyers, social media, and word of mouth in the AMS Nest. From our online survey responses, the most significant findings were that one of the biggest obstacles towards reducing post-consumer food waste was demographic factors such as upbringing identifying weak correlations between people who grew up in a household that did not undertake food waste avoidance and their attitude towards it now. The second method we used was interviews that enabled a more in-depth understanding of socio-demographic factors influencing food wastage. The findings from the interviews provided a clearer view of the data collected in the surveys citing differences in food waste infrastructure and cultural shocks as a major barrier to food waste avoidance. The final method we made use of was the naturalistic observation allowing for an overarching view of students' behavior regarding food and understanding specific behaviors contributing to food waste, involving categorizing waste types, estimating quantities, and identifying recurring patterns. To mitigate subjectivity in the ethnography portion of our research, we developed pre-determined measures which we adhered to. The triangulation of these diverse data

sources ensured a comprehensive and robust analysis, allowing for a nuanced understanding of post-consumer food waste at the AMS Nest.

Based on the outcomes of our research, we were able to develop and offer recommendations for the AMS Nest. Firstly, retailing food by weight allows students to determine how much food they wish to purchase and at what price, while offering a reusable program with a financial incentive that may motivate students to separate or eliminate waste, whilst encouraging them to save their leftovers for later meals. Secondly, conducting regular surveys to gather consumer preferences and ensure a responsive menu selection process which can empower students to curate their dining experiences.

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Lastly, we considered future potential directions for this research. This included further developing our methodology through more proactive measures as well as different additional methods. Another potential consideration for the future is the comparison of post-consumer food waste data between the AMS Nest at UBC and other universities.

# Introduction

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In today's fast-paced world, post-consumer food waste has become a major topic of contention. People prioritize convenience and time over conservation when it comes to food. As the world continues to grow at unforeseen rate, post-consumer food waste becomes a more alarming issue. Whether it be leftovers from the night before, or the less-than-appealing fruits and vegetables at your local grocery store, food waste seeps into our lives. Although such innocuous acts appear unimportant in the grand scheme of things, what lies within is an intertwined web of social, economic, and environmental implications that require our attention. With such an issue having a large reaching scope, if not addressed correctly, it could completely alter the trajectory of development on our planet. Today, over "one-third of the overall food production is lost or wasted yearly worldwide" which amounts to around "1 trillion USD per year" (Zeineddine et al, 2021, p.1).

Post-consumer food waste festers in numerous settings such as households, restaurants, and most importantly, higher education institutions. Post-consumer food waste within university settings has become a pressing global issue with far-reaching consequences (Verma et al, 2020). Campuses, such as the University of British Columbia, represent environments where a significant volume of food is consumed daily, making it crucial to understand the dynamics of food waste at the consumption level. The background of this study is grounded in the recognition that post-consumer food waste not only contributes to environmental challenges but also has economic and social implications (Principato et al., 2018). University campuses often serve as microcosms of society, with diverse populations exhibiting varied eating habits, cultural norms, and socioeconomic backgrounds. The AMS Nest, a central hub for dining and social activities, becomes an important focal point for investigating the patterns and drivers of post-consumer food waste. Therefore, this paper will investigate the main drivers and motivations of post-consumer food plate waste at the AMS Nest building and propose practical solutions to the food waste problem.

## Problem Statement

The primary objective is to identify the key drivers behind food waste at the consumption level within the AMS Nest. This includes exploring portion sizes, food quality, pricing, emotional influences, time constraints, and satiety (Deliberador et al, 2021). Such factors are essential for addressing the reasons behind post-consumer food waste in the AMS Nest and developing strategies that would help to reduce food waste. The significance of investigating post-consumer food waste at the AMS Nest is multifaceted. Our study contributes to the broader commitment to environmental sustainability at UBC and its goal of a “100% reduction in GHG emissions” (UBC, 2021). Food waste is a major contributor to greenhouse gas emissions and environmental degradation (Deliberador et al., 2021), making the mitigation of post-consumer food waste at the AMS Nest a meaningful step towards a more eco-friendly campus. We, along with SEEDS, seek to propose practical measures and interventions that can be implemented to reduce waste, promote environmental responsibility, and foster a culture of mindful consumption. The study acknowledges the financial implications of food waste for both consumers and the institution. Understanding and addressing food waste at the AMS Nest can lead to cost savings for individuals and enhance the university's resource allocation efficiency within its dining services (Cui et al, 2023).

The AMS Nest provides an ideal platform for educational initiatives that can raise awareness among students, staff, and visitors about the environmental and social consequences of wasteful practices. Such educational initiatives “can enhance students’ frugality” and “reduce their wasteful behavior”, fostering a sense of responsibility and mindfulness (Cui et al., 2023, p.7). Furthermore, the AMS Nest is a central gathering place for the university community. By addressing food waste here, our research promotes community engagement and encourages a sense of shared responsibility for sustainable practices, creating a positive impact beyond the study's immediate scope (Deliberador et al., 2021).

# Literature Review

## *A Lack of Awareness and Knowledge*

Pre-existing literature outlines numerous reasons that attribute key drivers behind post-consumer food waste. One key contributor is a lack of general awareness and knowledge which was illustrated by Ellison et al. (2019) who evaluated solutions for reducing food waste in university dining halls. Their study details the practical research that was carried out, such as collecting students' plates at the end of meals and sorting edible food waste into protein, fruits, and vegetables. Focus groups revealed that knowledge of food waste was limited, and the lack of awareness contributed to food waste. To address food waste, posters explained the reoccurring issue. Despite the use of education to address gaps in knowledge regarding post-consumer food waste, the passive strategies employed by the authors were generally unsuccessful. Although passive education was unsuccessful here, a study by Soma et al. (2020) found success. A difference between the research from Ellison et al. (2019) and Soma et al. (2020) is that the latter investigation on food wastage was in the context of households. Methods such as informational booklets and online games were used (Soma et al., 2020). As they carried out their research in the context of households, the relative success of their strategies may differ in a university setting. Between the two studies from Ellison et al. (2019) and Soma et al. (2020), there appears to be a gap in the literature as both fail to provide a successful scenario of passive education addressing students' lack of awareness in a university setting. However, a study by Laura Frank addresses this gap (2021).

Unlike the previous studies, Frank (2022) explores post-consumer food wastage and food insecurity among students. The author discusses the research process which consists of surveys and meetings to identify gaps in knowledge and understand the reasons behind food wastage and insecurity (Frank, 2022). Following this, an online course was developed that used instructional technology (Frank, 2022). This educated students and allowed them to reduce food waste and enjoy



free food. The methods used by Frank (2022) appear to be significantly more successful than the strategies employed by Ellison et al. (2019) as it was met with a much more emphatic response from students due to the lack of “stigma, shame, and guilt” they faced (Frank, 2022, p.1961). This previously posed barriers for many students. Such feelings could be promoted in the methods employed by Ellison et al. (2019) and Soma et al. (2020) limiting the success of their strategies.

### *The Importance of Food Quality and Quantity*

The discussion of the drivers behind post-consumer food waste goes beyond simply a lack of awareness and knowledge on the subject. Börühan and Ozbiltekin-Pala highlight this by attributing factors such as food satisfaction, portion size, and hygiene as reasons why post-consumer food waste persists (2021). First, food satisfaction plays a key role in influencing food waste as “people who make food selections on taste have higher inclinations to minimize food waste” (Wan et al., 2023, p.390). Secondly, convenience plays a major role in people’s lives and contributes to food waste as many do not have time to finish their food due to large portion sizes. Vermote et al. (2019) explored this by examining the effect of French fry portion reduction on food plate waste. They found that a reduction in French fry portion sizes reduced French fry plate waste which corroborates what was proposed by Börühan and Ozbiltekin-Pala (2021). Finally, a lack of hygiene or poor hygiene in the preparation of food decreases the likelihood of people finishing their meals due to personal health concerns.

While the key findings from Börühan and Ozbiltekin-Pala (2021) identify the reasons behind post-consumer food waste, other studies have addressed the impact of food quality and quantity through plate measurements. Such a strategy can be immensely useful in quantifying drivers addressed by Börühan and Ozbiltekin-Pala (2021) like food satisfaction, portion size, and hygiene. One study that used such a method was from Ellison et al. (2019). Their study details the practical research that was carried out, such as collecting students' plates at the end of meals and sorting edible

food waste into protein, fruits, and vegetables (Ellison et al., 2019). Similarly, another source undertook a similar process by separating food waste into vegetables, grains, meats, eggs, and aquatic products (Qian et al., 2022). Separating the food into these three categories allows the researchers to identify where the majority of post-consumer food plate waste is occurring. This enables the university to make changes to its menu accordingly. However, the research carried out by Ellison et al. (2019) is limited by its inability to gauge whether post-consumer food waste is occurring due to food satisfaction, portion size, or taste (Börühan and Ozbiltekin-Pala, 2021). This highlights a gap in the literature. Another study done by Ahmed et al. (2018) at Montana State University addresses this gap. They outlined the previously stated implications associated with post-consumer level food waste. Their methodology involved total food waste measurements distinguished by pre-consumer and post-consumer, and subsetting by edible, liquid, and non-edible food waste. Plate measurements of post-consumer food waste used a modified quarter-waste approach described by Hanks et al. (2014), which provides an objective framework for quantifying food leftovers left on plates. Evaluating the findings from and Ellison et al. (2019) Ahmed et al. (2018), despite the latter providing a more in-depth understanding of how food waste plate measurements can help to identify key drivers behind post-consumer food waste, both fail to propose a practical and viable solution for the universities where the problems are occurring.

#### *The Influence of Demographic Variables on Attitude*

Previously documented studies on post-consumer food waste have identified that some of the key reasons behind this issue can be attributed to a general lack of awareness and poor food quality overall. This left a gap in the relationship between demographic variables and post-consumer food waste. But today, more and more articles have been published on the importance of this relationship identifying a correlation that needs to be addressed and investigated.

From pre-existing literature on this relationship, people are driven to reduce waste for numerous reasons: cost savings, ethical obligations, and health issues (Deliberador et al., 2021). Furthermore, cultural norms and personal experiences also play a key role in influencing attitudes and behaviors toward food waste (Deliberador et al., 2021). While Deliberador et al. (2021) reference the impact of socio-demographic factors like culture and personal experiences, they do not delve too deep into this. What Deliberador et al. (2021) fail to address is explored by Filimonau et al. (2022). They discuss the relevance of religious values and family upbringing as factors that precede food waste avoidance expanding upon the ideas introduced by Deliberador et al. (2021). Their research determined the importance of “family upbringing as a determinant of consumer attitudes and behavioral intention” as well as “religious values in family upbringing” towards food wastage avoidance (Filimonau et al., 2022, p.2). The findings from Deliberador et al. (2021) provide a general outline of some socio-demographic factors that influence food wastage. Filimonau et al. (2022) explore these factors in significantly more depth addressing shortcomings in the literature. Despite this, both fail to discuss the relevance of socio-demographic factors in a university setting choosing to discuss the factors generally. This gap in the literature is addressed by a study by Mganga et al. (2021).

While Deliberador et al. (2021) and Filimonau et al. (2022) discuss the relevance of socio-demographic factors in shaping attitudes towards food wastage, Mganga et al. (2021) build on the ideas they discuss and explore it in a university setting in Indonesia. During their data collection process, they used a survey to collect data on demographic factors like gender, age, faculty, and study program. Their findings showed that “a lack of concern for food waste” amongst students “accelerate[d] food waste generation” (Mganga et al., 2021, p.5). The authors also found that “subjective norms” were extremely vital in influencing the students’ behaviour towards food waste, going as far as to say that the role played by “family members and friends influences their motives for positive behaviour towards food waste” (Mganga et al., 2021, p.5). These findings corroborate what was discussed by Filimonau et al. (2022) in their discussion of family upbringing as a determinant in

the outcome of food wastage. Despite Mganga et al. (2021) exploration of socio-demographics and food wastage in a university setting building upon the existing literature offered by Deliberador et al. (2021) and Filimonau et al. (2022), they do not further discuss the relevance of other demographic factors specific to a university setting like faculty and study program on food wastage leaving a gap in the literature.

## Research Methodology

Our discussion and critique of existing literature provided us with insight into how we need to frame our research. Thinking of food wastage in terms of three foundational concepts (Lack of awareness and knowledge, food quality and quantity, impact of socio-demographics on attitude) allowed us to develop research methods that encapsulate the true extent of post-consumer food waste at UBC. Like Börühan and Ozbiltekin-Pala (2021) who utilized a comprehensive study approach, we used a mixed methodological approach. We distributed an online survey on Qualtrics, conducted in-person and online semi-structured interviews, and observed the behavior of students toward food waste in a university setting. As our goal is to specifically uncover the main reasons behind post-consumer food waste in the AMS Nest, we will only be interacting with the UBC community.

### *Strengths and Limitations*

Although a mixed-methods approach ensures that data collection is both reliable and accurate, there are limitations to our methods. Online surveys that have fewer questions and a shorter length tend to have a higher response rate (Evans and Mathur, 2018). Therefore, we reduced the number of questions to ensure that the completion time for the survey was between two to five minutes. However, this limitation on questions meant that we could not ask in-depth or open-ended questions. Luckily, this was addressed with interviews. On the other hand, online surveys are extremely useful

when it comes to their distribution providing a fast and timeless experience that is convenient for all as well as collecting data that is easy to input and analyze (Evans and Mathur, 2018).

Additionally, interviews enabled for an open-ended conversation between the interviewer and participants providing insight into some of the more in-depth questions and topics that could not be addressed in the online surveys. With an in-person interview, “the interviewer and interviewee can directly react on what the other says or does” minimizing any misunderstandings that might occur in other methods (Opdenakker, 2006, p.3). Albeit it is not without its flaws. It is impossible to validate any of the data collected in an interview as it is solely qualitative. Furthermore, “the interviewer has to formulate questions as a result of the interactive nature of communication” which can lead to questions veering off-topic (Opdenakker, 2006, p.3).

Ultimately, the naturalistic observation method “mimic(s) real life as closely as possible” enabling those being observed to continue with their normal activities (Verster et al., 2019, p.2). This allows for a clear view of participants' behaviour without the influence of external stimuli. Its limitations come down to the lack of scientific controls present which can result in “subjective self-reports” in which what is being observed could be misinterpreted (Verster et al., 2019, p.4). The subjective nature of naturalistic observations questions the accuracy and the reliability of the data produced. Especially in our case as we try to identify students' behaviour regarding how they separate food waste in the AMS Nest.

### *Ethics*

To ensure that we complied with ethical practices, we made sure that the consent and confidentiality of those who participated in our data collection methods were upheld. For our online survey, the privacy of participants was implemented by using the online survey tool Qualtrics which is powered by UBC. For the ethnographic portion of our methodology, which consisted of naturalistic

observations, we made sure that the public places in which data collection was occurring (The AMS Nest) did not require consent to enter and only collected data in areas that were accessible to everyone. With the interviews, we ensured the anonymity of participants and made sure that consent was obtained before recording. Not only are our methods ethically sound, but our overall research objective also highlights ethical practices due to its overarching nature in addressing post-consumer food waste which benefits all students on campus and the institution.

#### *Online Survey*

Our online survey (Appendix A) was developed to focus on addressing students' perceptions of post-consumer food waste and gain an understanding of what drives it in a university setting. It was operationalized using data gathered from surveys in pre-existing literature like that of Mganga et al. (2021) and Filimonau et al. (2022). This helped to frame the questions that we included in our online survey. Questions focused on consumption patterns, portion sizes, reasons for food waste, and awareness of environmental consequences. The survey consisted of a mix of open and closed-format questions. For example, one close-ended question which asked why people discard their food after consumption used some of the points discussed in the literature review with answers like “portion size” and “preference of taste”. Other questions used a Likert scale to provide a quantitative outlook. One question asked how often people follow food waste separation methods on a scale from one to five.

A call for participation flyer (Appendix C) was used to advertise the survey. This was posted on a bulletin board on every floor of the AMS Nest as well as on social media platforms such as Instagram and Reddit. Furthermore, people in the Nest were approached and asked if they would like to participate in the survey.

The survey was developed using UBC Qualtrics and it was selectively restricted to only those who eat in the AMS Nest using skip logic on a question to filter those who selected that they did not eat in the Nest. Most of the respondents were students with others selecting that they were “employee[s] at UBC” or “visitor[s]”. One of the most notable challenges with the survey was the completion rate. We sought a sample size of at least 60 responses but concluded with 53. Of these, 49 completed the survey leaving 49 responses. While this is an excellent completion rate, a larger number of valid responses would have enhanced the statistical conclusions that might be drawn from our findings.

### *Interviews*

The interviews allowed us to follow up on some of the close-ended questions in the online survey. Those who wished to participate in the interview included their email at the end of the online survey. Our call for participation flyer (Appendix C) was used to advertise the interview. The interview facilitated an open-ended conversation providing valuable qualitative data on attitudes towards post-consumer food waste and potential areas for intervention. The questions were based on our review of previous literature and responses from the survey. The questions enabled interviewees to draw from their own experiences. We discussed what piqued their interest in food waste and the methods they use to reduce it. This provided a very in-depth understanding of how personal beliefs and upbringing can influence one’s attitude and behavior toward food waste.

One of the most notable challenges associated with the interview was acquiring participants. We initially received seven affirmative responses to interviews, however we were only able to successfully conduct six as one person either did not respond or lost interest in participating. We were concerned that respondents might have overlooked the question encouraging them to participate in the interview due to the fact it was located at the end of the online survey. As a result, we set ourselves a

benchmark on the number of interviews to complete which was at least six sources of evidence (Marshall et al., 2013). By the end of the research process, we had obtained six interviews providing a wide array of different perspectives on food wastage and offering qualitative data that corroborated what was uncovered in the literature review and what was collected in the surveys.

### *Observational Research*

Given the sheer volume of data anticipated, it was imperative for us to transcribe surveys and interviews and conduct a qualitative analysis. Our primary objective in the observational study was to delve into and closely monitor our subjects within their natural habitat, such as the environment of the AMS Nest, devoid of any external interference. It is important to note that our approach was not aimed at establishing a definitive cause-and-effect relationship, primarily due to the potential presence of confounding variables. Nevertheless, leveraging this method allowed us to glean invaluable insights into food consumption habits and behaviors, enabling us to craft questions in a manner that was not only cost-effective but also ethically sound.

However, it is crucial to underscore a noteworthy caveat encountered – the challenge of discerning the nature of food disposal practices and identifying whether the discarded packaging was biodegradable or not. This aspect posed a significant hurdle in our data collection process, as it required a keen eye and meticulous attention to detail during our observations. Furthermore, the observations were only done twice and not repeatedly to get accurate and reliable data. Despite these challenges, our commitment to rigorous methodology and thorough documentation allowed us to navigate through these complexities and extract meaningful insights.



# Results and Analysis

## Online Surveys

From a total of 53 responses, we had 49 completed. Among these respondents, most participants were current students (94.1%) and the rest were employees working at UBC (5.9%). We expected to have participants categorized by 3 different sections: age, ethnicity, and gender. We filtered participants using skip logic. We accepted responses from those who had answered “yes” or “sometimes” and disregarded those who answered “no”.

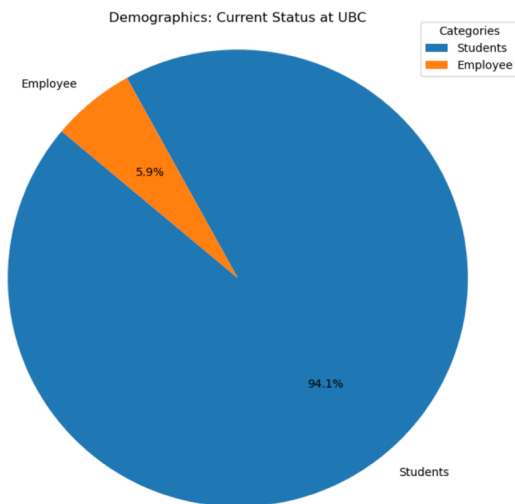
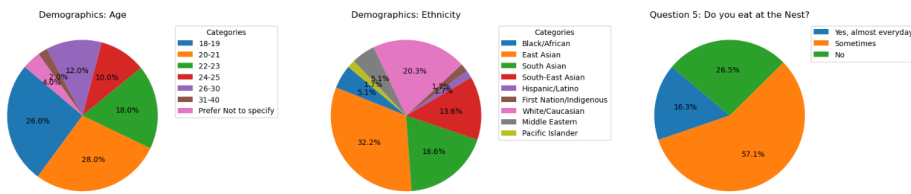


Figure 1: Graph showing the status of respondents

We gathered that 53.06% of respondents were between 18 to 21, 18.37% were between 22 to 23, 10.20% were between 24 to 25, 12.24% were between 26 to 30, 2.24% were between 31 to 40 and 4.08% preferred “not to specify.” Examining ethnicity, 5.10% were Black/African, 32.20% were East Asian, 18.6% were South Asian, 13.6% were South-East Asian, 1.7% were Hispanic/Latino, 1.7% were First Nation/Indigenous, 20.3% were White/Caucasian, 5.1% were Middle Eastern and 1.7% were Pacific Islanders. Of the respondents, 25 were male, 22 were female and 2 answered “prefer not

to specify”. From the most important question on whether respondents ate in the AMS Nest, 8 answered “almost every day”, 28 answered “sometimes” and 13 answered “No” and were forced to exit from the survey.

Figures 2,3,4 : Graphs showing respondents’ age, ethnicity, and likelihood of eating in the Nest



We aimed to identify whether participants were aware of the environmental impact, key drivers, and mitigative strategies regarding food waste. We questioned participants how often they threw away leftovers, what were the main reasons they discarded food, whether they were aware of the environmental impact of food waste, and what measures they currently take to their food waste.

Almost 60% of the respondents stated that they did not leave any leftovers after having a meal, while 43.3% of respondents answered that they had leftovers (Figure 5). 20.5% of respondents answered that satiety played a key role in food waste (Figure 6). Additionally, 20.5% of respondents stated that the serving size offered were too large, and 25.6% of respondents stated the food at the Nest was excessively greasy and 23.1% responded that preference of taste did not match their liking (Figure 6).

Question 9: How often do you throw away leftovers?

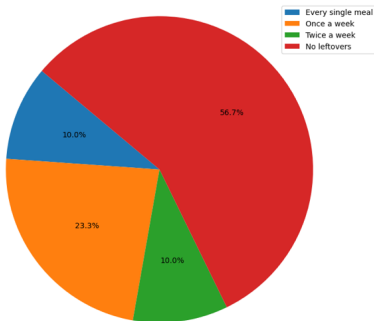


Figure 5: Graph showing how often respondents throw away leftovers

Q12 - What are the main reasons you discard food after consumption?

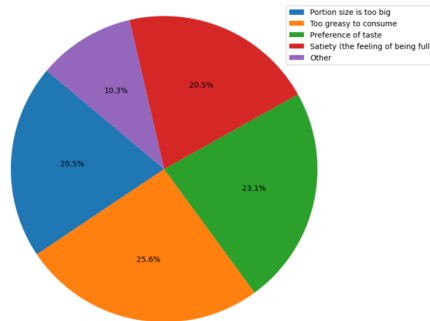


Figure 6: Graph showing the main reasons consumers discard food

We asked participants if they would be interested in rotating menus at the Nest and 75% responded “yes” as consuming similar food for the entire academic year may cause people to be dissatisfied with the food options (Figure 7).

Q17 - Would you want to see rotating menus at the nest?

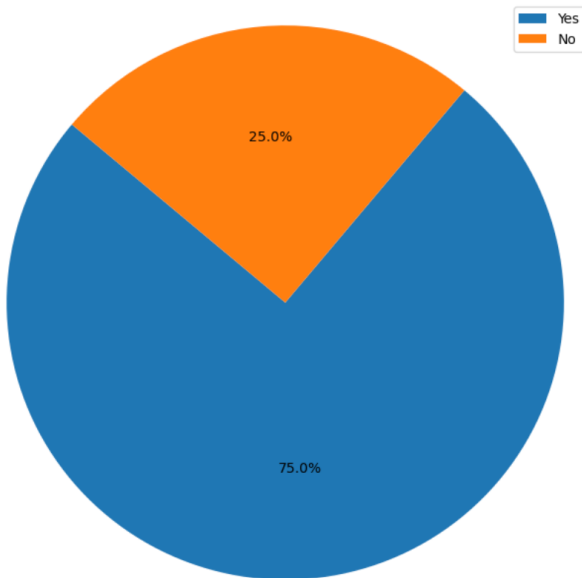
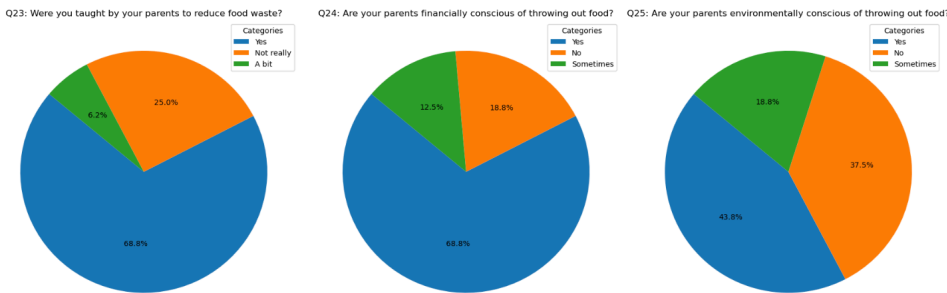


Figure 7: Graph showing respondents' perception of rotating menus

From this, it becomes evident that portion size and overall quality of food limit consumers ability to finish food. Therefore, restaurants in the Nest could reduce portion size to reduce food waste as well as reduce cost. Customers can pay less for their food and AMS can minimize their financial losses. Furthermore, 75% of respondents wish to have more diverse menus at the AMS Nest (Figure 7). This highlights the need to alter menus and cooking methods in the Nest which could see the introduction of healthier options.

Based on the literature review, another set of questions was added to identify whether financial status, environmental awareness, and personal background contribute to food waste (Appendix A). 25% of respondents noted that they were not taught by their parents to reduce food waste, 18.8% stated they are not financially conscious about throwing out food and 37.5% stated that their parents are not environmentally conscious about throwing out food waste (Figures 8, 9, 10).

*Figures 8, 9, 10: Graphs depicting the influence of upbringing, financial status, and environmental awareness on food waste.*



These results show the importance of family education in reducing food waste. From the data, it is evident that there is a need for the restaurants at the AMS Nest to reduce the volume of food produced and adjust prices. Furthermore, UBC as a post-secondary institution can highlight the importance of food waste mitigation and composting to those involved at AMS. While a strong correlation within the data could not be made due to a small sample size, the survey provided key insights into the drivers and motivations behind food waste at the AMS Nest.

### *Online & In-person Interviews*

Our interviews yielded valuable insights that fueled a deeper discussion on food waste reduction, encompassing personal experiences and behaviours. All six interviews conducted were all students at UBC. Differences in personal experiences demonstrated how financial security, education, and cultural upbringing at an early age influenced behavior toward food waste.

We initiated our interview by exploring their familiarity and knowledge with post-consumer food waste. The first participant discussed her approach highlighting that reducing food waste is something that she has always practiced. She considers it to be common knowledge as this is a normal habit in her household. She ensures that she finishes her meal, whether she enjoys the taste or not, motivated by her instinct to not have any leftovers. She emphasized that her actions were primarily influenced by her parents' teachings at a young age, stemming from their experience of coming from a low-income background. The focus here was to determine how cultural upbringing interconnects with financial status.

Another participant conveyed how reducing food waste was ingrained in her daily routine, directly resulting from her mother's influence. She emphasized that discarding leftovers was considered unacceptable in her household. This perspective sheds light on the fact that for some individuals, disposing of leftovers is not inherently negative, which may lead them to overlook its implications due to their differences in upbringing. Almost identical to the first interviewee, she mentioned that her mother grew up in a household where finance and food were scarce, influencing how she was raised to perceive food waste. She stated:

*“Growing up in an Asian household, it was very strict when it came to food waste and how my mother was taught was how she taught me.”*

They mentioned that cultural differences influenced their attitudes toward meal portions and taste preferences and that people who come from Western settings might have different perceptions and are more willing to discard food they dislike.

Financial security was one of the leading drivers identified in food-waste avoidance. From three interviews, it became clear that financial status plays a large role in people's perception of food. The following statement from one interviewee captured this:

*"The more food waste there is, the more money I'm wasting and I can't afford to be wasting food because I live alone."*

Compared to when she was living at home, she would easily discard her food as it did not impact her finances significantly. She alluded that people who have a higher income status are more willing to waste food and can absorb the financial impact.

One participant discussed his motivation for reducing food waste. He described how his country deals with severe food waste issues due to a lack of appropriate systems. We noted that education plays a major role in mitigating this problem. Likewise, another participant elucidated his lack of awareness regarding food waste. His home country had no proper system when it came to this issue. The participant mentioned that after moving to Vancouver, he was unaware of composting as it was completely different from how he grew up. A statement from the interviewee captured this sentiment:

*"I figured I just put it anywhere and it all goes to the same place eventually,"*

When we questioned all our interviewees about the primary reasons for producing leftovers, "large portion sizes", "taste preferences", and occasionally, "overbuying" was mentioned. A

participant explained that the minimum quantities available for purchase often exceeded their consumption needs. This resulted in excess food that ultimately went to waste. Particularly if they found the taste unappealing.

A consistent pattern emerged across our interviews, mirroring the themes found in existing literature. Portion size and taste preferences were mentioned by participants as significant factors contributing to food waste. Despite the influence of financial considerations and environmental awareness, the aversion to unpleasant-tasting food remained a prominent driver of waste generation. This underscores the complexity of the issue, as even individuals motivated to minimize waste may still discard food if they find it unpalatable. Furthermore, all interviewees were of either East, South, or Southeast Asian background. It's crucial to acknowledge that this demographic consistency may not apply to individuals from Caucasian backgrounds. Their cultural upbringings could vary slightly, and this observed pattern may not be applicable in other cultural contexts.

#### *Observational Research*

The observation was planned with two distinct time slots carefully chosen to capture varied dynamics of activity. The first slot, spanning from 12:30 p.m. to 1:00 p.m., coincided with the lunch rush, characterized by a surge in participation and heightened activity. The second time slot, spanning from 4:00 p.m. to 4:30 p.m., represented a quieter interlude marked by fewer numbers and a more subdued atmosphere.

Both observation sessions were conducted at the same location, ensuring consistency and comparability of data. Tally marks were employed as a methodical means to document instances of waste separation and engagement in waste disposal activities. Furthermore, special attention was paid to the number of individuals opting for reusable containers, serving as a pivotal metric for assessing

sustainable behavior patterns among participants. This comprehensive approach allowed for a nuanced understanding of waste management practices and sustainability efforts within the observed setting.

Observations from Slot A revealed that four out of 93 participants observed, opted for reusable containers, reflecting a mere 4.3% utilization rate. Notably, a significant majority, accounting for 82.8% of participants, did not separate waste, while 17.2% engaged in waste separation practices.

Observations from Slot B, occurring during the quieter period, unveiled a distinct shift in participant behavior. Among the 57 participants observed disposing of waste, 14 were observed utilizing reusable containers, indicating a substantial increase compared to Slot A. This amounted to more than triple the utilization rate, highlighting a notable shift in sustainability-conscious behavior. Additionally, 31.6% of participants demonstrated active engagement in waste separation, indicating a heightened environmental awareness, while 68.4% did not partake in separation practices.

These findings underscore the interplay of factors such as time, participant load, and convenience in shaping participant behavior. The data suggests that during periods of heightened activity, where time constraints may be more prevalent, there is a tendency towards lower rates of waste separation and minimal utilization of reusable containers. Conversely, during quieter periods, participants exhibited a heightened environmental consciousness, with a greater propensity towards waste separation and an increased adoption of reusable containers. This underscores the influence of environmental context and individual decision-making processes in shaping sustainable behaviors. Slot B, with its reduced busyness, provided individuals with the mental space to make deliberate and environmentally conscious choices. Given that the observational research was conducted for only one day and across two specific time slots, it's important to note that the results may vary on different days and during different time slots due to the dynamic nature of the variables involved.



## Research Significance and Implications

As discussed in the review of our literature, the key three points that drive post-consumer food waste are a lack of awareness, overall poor quality of food, and socio-demographic variables. While there appears to be a plethora of previous literature that establishes what the causes of food waste are at the general level, there appears to be a gap in the practical solutions for the issue in a university setting. Despite all this information, the factors regarding student behavior towards food waste in the AMS Nest are limited. Therefore, our research will enable us to gain insight into such gaps.

Our analysis provides insights into the micro and meso-level manifestations of food waste in the AMS Nest. Although data collected through our online survey is limited and not incredibly exhaustive due to the limited questions included and limited time, the data collected from the survey can serve as a platform that further studies can build on. Furthermore, the data collected did provide important insights into the influence of socio-demographics on student's behavior towards food waste. While not strong enough to establish a correlation, the data did support and build upon what was cited in the literature review. A large portion of the data collected was also directly related to the interview portion of our methodology, providing a clearer understanding of students' behavior.

Data collected through our online and in-person interviews provided a much more in-depth understanding of some of the factors that influence students' perceptions of food waste. Additional results from the interviews included student recommendations regarding policies on addressing food waste in the AMS Nest, which is direct feedback from the population that eats there. Having this valuable first-hand feedback allows us to identify what some of the potential barriers to food waste are.

Lastly, given a lack of comprehensive data and research on student's behavior toward post-consumer food waste, a naturalistic observation study was necessary. The data collected through the

observational studies provided the opportunity to witness firsthand the behaviors and practices of students in their natural settings. It also complemented and enriched the insights gleaned from our survey data and interviews. It provided real-time validation of the behaviors reported by participants and offered a deeper understanding of the factors influencing food waste practices beyond self-reported data. This allowed us to discern patterns and trends in food waste practices based on environmental contexts and external factors, something which was lacking with existing research on food waste in the AMS Nest.

## Conclusion and Recommendations

Post-consumer food waste in university settings is a complex issue with social, economic, and environmental implications. The literature review highlighted existing gaps in understanding this phenomenon within university contexts. As universities play a central role in shaping future leaders and promoting sustainable practices, addressing post-consumer food waste is a shared responsibility. The call to action is for further research, policy development, and practical initiatives aimed at reducing food waste in universities. By integrating sustainable practices into campus life, universities can set an example for environmentally conscious behaviors, fostering a culture of responsibility among students, and contributing to broader sustainability goals.

Based on our research, several recommendations can be proposed to tackle post-consumer food waste in the AMS Nest. Offering food for sale by weight along with reusable options and financial incentive presents an enticing opportunity. Many participants expressed dissatisfaction with portion sizes and unpalatable tastes, indicating a desire for more control over their dining experience. Offering a reusable program with a financial discount will encourage students to separate or reduce waste, as well as conserve their meals for later.

By implementing a system where students can allocate a set budget per meal, such as \$5-10, they gain the freedom to select the amount of food they purchase at their desired price. This approach

encourages experimentation with different options and allows for flexibility in portion selection. Moreover, it provides valuable feedback to the AMS by highlighting popular menu items and identifying less favored options, facilitating informed menu adjustments. Additionally, conducting regular surveys to gather consumer preferences ensures a dynamic and responsive menu selection process. By adopting this approach, we not only empower students to curate their dining experiences but also generate valuable data to drive menu innovation and enhance overall satisfaction within the AMS Nest.

If future projects plan to use our methodology and ethnography, some alterations should be made. The further development of our methodology and ethnography may provide a more comprehensive understanding and outlook on post-consumer food waste in the AMS Nest. A more proactive method to distribute our surveys could have seen a larger sample size which would have strengthened the accuracy and reliability of our data. Additionally, other methods could have been used to analyze our data such as coding analysis across both the survey and interviews to address key points in food wastage and identify commonalities.

In terms of further expanding this project, due to the plethora of pre-existing literature on food waste in university settings, and the valuable data collected in our study, a comparison between the issue in the AMS Nest at UBC and other university campuses could be potentially beneficial. By comparing two schools of similar sizes, future research can identify whether student behavior towards food waste avoidance varies between universities and evaluate the reasons for this. A comparison between the data collected in this project and future research could provide a critique of UBC's strategies for addressing food waste and identify more successful methods for the institution.

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# Appendices

## Appendix A - Qualtrics Survey

Default Question Block

Skip to

End of Survey if I do not consent is Selected

Welcome to our survey!

Our study is called Post-Consumer Food Waste, and its for our Geography class at UBC (GEOG371). We are interested in identifying reasons behind post-consumer food waste in the UBC Nest and examining human behaviour regarding food waste. We are collecting surveys until April 15th. The survey will take approximately 5 minutes of your time.

By answering our survey, you are consenting to participate in this research and acknowledge that you are at least 18 years of age. Please know that your participation is entirely voluntary and that your responses are anonymous.

At the end of the survey, we ask if you'd be willing to be contacted for an optional interview. Only if you choose to provide your email will your answers be linked to you so we can follow-up on your responses, and your identity will remain completely confidential.

The Co-principal Investigators for this project are Geraldine Pratt and Bonnie Kaserman, our instructor, who can be reached at [bonnie.kaserman@ubc.ca](mailto:bonnie.kaserman@ubc.ca) if you have any questions about this study. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study (ethics ID H16-03315), contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail [RSIL@ors.ubc.ca](mailto:RSIL@ors.ubc.ca) or call toll free 1-877-822-8598.

I consent  
 I do not consent

Q1

Skip to

End of Survey if Visitor is Selected

Which of the following applies to you?

Employee at UBC  
 Student at UBC  
 Visitor

Q2

How old are you?

18-19  
 20-21  
 22-23  
 24-25  
 26-30  
 31-40  
 41+  
 Prefer not to specify

Q3

Choose the option(s) that best describes your ethnicity

Black/African  
 East Asian  
 South Asian  
 South-East Asian  
 Hispanic/Latino  
 First Nation/Indigenous  
 White/Caucasian  
 Middle Eastern  
 Pacific Islander  
 Other/please specify: \_\_\_\_\_

Q4

What is your gender?

Male  
 Female  
 Two/Spit  
 Prefer not to say  
 None of the above. I identify as: \_\_\_\_\_

Q5 \*

[Skip to](#)

End of Survey if No is Selected

**Do you eat at the Nest?**

Yes, almost everyday  
 Sometimes  
 No

---

Q20

**Do you prefer to buy food at the nest or bring food from home?**

Buy food at the nest  
 Bring food from home

---

Q7

**If you cook or buy food outside the Nest, how often do you bring it to the Nest to eat?**

Once a week  
 Twice a week  
 More than 3 times a week  
 Every weekday  
 Everyday  
 None

---

Q8

**Do you usually finish all the food you eat at the Nest?**

Yes  
 Sometimes  
 No

---

Q9

**How often do you throw away leftovers?**

Every single meal  
 Once a week  
 Twice a week  
 No leftovers

---

Q10

**How likely are you to separate your food waste?**

Very likely  
 Somewhat Likely  
 Not likely

---

Q11

**On a scale from 1-5, 1 being not that often and 5 being all the time, how often do you follow food waste separation?**

1  
 2  
 3  
 4  
 5

---

Q12

**What are the main reasons you discard food after consumption?**

Portion size is too big  
 Too greasy to consume  
 Preference of taste  
 Satiety (the feeling of being full)  
 Other (Please specify)

Q13

Are you aware of the environmental impact of food waste?

- Yes
- No
- Somewhat

Q14

Do you compost your food scraps?

- Yes
- No

Q15

How often do you meal prep a week?

- Once a week
- Twice a week
- Three times a week
- Everyday
- None

Q16

What measures do you currently take to minimize your post-consumer food waste?

- Create a meal plan
- Measure the weight of my meals
- Label "Date Made" and "Date Expiry"
- Other (Please specify)

Q17

Would you want to see rotating menu's at the nest?

- Yes
- No

Q18

Are you financially conscious if you throw your leftovers out?

- Yes
- No
- Sometimes

Q19

Do you like the food options at the nest?

- Yes
- No
- Sometimes

Q20

Are u environmentally conscious of the food you throw out?

- Yes
- No
- Sometimes

Q21

What do you do if you have leftover food?

- Throw it out
- I eat it for later
- I bring it home



Q22  
Do you throw out your leftover if you don't like the taste?

Yes  
 No - I just eat it for later

Q23  
Were you taught by your parents to reduce food waste?

Yes  
 Not really  
 A bit

Q24  
Are your parents financially conscious of throwing out food?

Yes  
 No  
 Sometimes

Q25  
Are your parents environmentally conscious of throwing out food?

Yes  
 No  
 Sometimes

Q26 ★

▼ [Skip to](#)  
Thank you for your interest! Please g... if Yes Is Selected

▼ [Skip to](#)  
End of Survey If No Is Selected

Thank you for taking part in our survey. Would you be interested in taking part in 20 minute long interview?

Yes  
 No

Q27 ...

[Skip destination](#) [Go to skip origin](#)

Thank you for your interest! Please give us your email so that we can contact you. Be aware that by giving us your email we will be able to connect your email with your responses. That way we can follow up on your answers, but your identity will remain confidential.

[Import from library](#) [+ Add new question](#)

*Appendix B - Interview Questions*

1. How did you become interested in reducing food waste?
2. What motivated you to take action?
3. What specific strategies have you done to effectively minimize food waste in your day-to-day life?
4. Can you share your own tips to minimize food wastes? (Which can be easily applicable to other individuals)
5. How do you keep track of all the food you buy so that it doesn't get wasted? (due to food being expired)
6. Do you often pack your own food at home, and bring it to school to eat?
  - a. If yes, do you often have any leftovers?
    - i. If yes, how do you dispose of them?
7. How do you manage food scraps or food that cannot be consumed?
  - a. Are there any specific methods that you would recommend to us? (For example, composting)
8. Are there any societal factors that influenced your thoughts about reducing food waste? (For example, carbon footprint, inflation)
9. Can you share with us some of the measures you are currently taking to minimize post-consumer food waste in your household?
  - a. What led you to take this good habit?
10. What are some challenges you've faced when trying to reduce food waste?
  - a. How did you overcome these challenges?
11. Do you prepare your own food by having meal planning?
  - a. If yes, does it have an effect in food waste reduction?
    - i. How do you design your own meal plan? (For example, do you construct your meal plan based on eating habits, how much you eat, etc)
12. What kind of actions should individuals (or organizations) take to minimize the post-consumer food waste?
13. Are there any questions? or any more recommendations for individuals willing to reduce their food waste?

**CALL FOR PARTICIPATION**

# HAVE TIME TO HELP REDUCE WASTE?

We want to know your ways!

**HERE'S THE LINK**

[https://ubc.ca1.qualtrics.com/jfe/form/SV\\_5ckqX8xiThOD0IU](https://ubc.ca1.qualtrics.com/jfe/form/SV_5ckqX8xiThOD0IU)

**SCAN ME!!!**



**ABOUT US**

We are a group of UBC students and are a part of GEOG 371 working alongside SEEDS. We are conducting a research project on post-consumer food waste and human behaviour. The survey should take less than 5 minutes. We are collecting responses until April 1st, 2024.

