Promoting Campus Food Security through Food Recovery

An Evaluation of the UBC Food Recovery Pilot Program

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Prepared for: UBC Food Services

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SEEDS Sustainability Program

UBC sustainability

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Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

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EXECUTIVE SUMMARY

Food waste is a complex issue that actively impacts the social, economic, health, and environmental domains of our planet. Each year in Canada, an estimated 35.5 million metric tons of food is lost or wasted, of which 11.2 million metric tons is considered avoidable (Second Harvest, 2019). Edible food that is necessarily wasted in Canada also contributes 56.6 million metric tons of CO_2 equivalent emissions annually (Global Alliance for the Future of Food, 2022). While this food is being wasted, food insecurity, defined as inadequate or insecure access to food due to financial constraints, persists in Canada (Tarasuk & Mitchell, 2020). On the UBC campus, 38.5% of students identify themselves as food insecure (Carry et al., 2019). To address these interrelated problems, the practice of recovering edible food for consumption with the co-benefits of reducing greenhouse gas emissions and promoting food security.

In response to the pervasive issues of food waste, food insecurity, and climate change, the UBC Food Recovery Program was created in 2020. This program is a new initiative that recovers food from Open Kitchen Residence Dining Hall through a partnership with UBC Food Services, UBC SEEDS, UBC Seeders, and UBC Sprouts. Recovered food is transported by student volunteers at UBC Seeder to UBC Sprouts who distribute the food to the UBC community through their Community Eats program. Given that this program is new, UBC Food Services has identified a need to evaluate its progress and to learn from other food recovery programs. Within this context, this research project aimed to help advance food recovery on the UBC Campus that reduces food waste and promotes food recovery. The goal of this research was to evaluate the current pilot program and to create a guideline that has relevant focus areas, priorities, and recommendations for the program. Our objectives for this research were to 1) identify promising practices and challenges of other food recovery programs 2) assess the impacts, costs and benefits, and challenges of the UBC Food Recovery Pilot Program 3) Identify focus areas, priorities, and recommendations to create a guideline which will inform the development of a Campus Food Recovery Strategy.

To conduct our research, we applied a Community-Based Action Research (CBAR) framework to actively collaborate with our project partners and build towards social change together (Clark and Ventures, 2016). We engaged with various groups both on and off the UBC campus that were directly involved in the issues of food recovery and food insecurity. Our research included both primary and secondary data collection. Our primary data was collected through interviews with stakeholders involved in the UBC Food Recovery Pilot Program including UBC Food Services, Open Kitchen, UBC Seeder, UBC Sprouts and Vancouver Food Runners. We also met with AMS Catering, who are not directly involved in the pilot program, but had relevant insights. Our second group of interviews were with other campus food recovery programs including Colorado State University, Washington State University, MealCare, and the University of California San Diego. Our secondary data was collected through an environmental scan of challenges and promising practices of other food recovery programs in Canada and the United States.

The recurring themes found in both our primary and secondary data include considerations around food recovery logistics, funding, food safety and liability, volunteer recruitment and sustainability, food waste recording, and campus food policy. Drawing from these themes, we created recommendations to help solidify the sustainability of the UBC Food Recovery Pilot Program. Our immediate recommendations include creating a mission statement to help define and guide the program, streamlining communication between project partners, solidifying the program logistics, efficiently monitoring and reporting the recovered food, sharing the program's impact, and increasing staff awareness and education. In the midterm, we recommend involving Vancouver Food Runners in the program to provide sustainable transportation, incorporating the recovery of catered foods in future food recovery guidelines, and building a relationship with UBC Community Food Hub. In the long-term, funding to support a position directly related to managing food waste and recovery would help ensure the longevity and viability of the program.

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LIST OF ABBREVIATIONS

AASHE → Association for the Advancement of Sustainability in Higher Education

AMS → Alma Mater Society

CBAR → Community-Based Action Research

CO2 → Carbon Dioxide

CSU → Colorado State University

GPA → Grade Point Average

SEEDS → Social Ecological Economic Development Studies

UBC → University of British Columbia

UBC FS → UBC Food Services

UBCFSP → UBC Food System Project

UBC OK → UBC Open Kitchen

UCSD → University of California San Diego

U of G → University of Guelph

VFR → Vancouver Food Runners

WSU → Washington State University

1. INTRODUCTION

1.1 RESEARCH TOPIC

While food waste refers to the disposal of unconsumed food after it has arrived at the retail level of the food supply chain, food insecurity refers to the lack of consistent access to food due to financial constraints (FAO, 2019; Tarasuk & Mitchell, 2020). To have both issues simultaneously seems paradoxical, yet it is a challenge faced globally. Food recovery, also referred to as food rescue, is the practice of preventing edible food from ending up in landfills through redistribution. Food recovery can help tackle both food waste and food insecurity, creating a cyclical solution with co-benefits of increased food security and decreased environmental impacts.

Recognizing the importance of reducing food waste and increasing food security on the University of British Columbia (UBC) Campus, UBC Food Services created the UBC Food Recovery Pilot Program at Open Kitchen Residence Dining Hall. The pilot program is managed by UBC Food Services and Enactus, an entrepreneurial non-profit club at UBC. It recovers unserved food and donates it to a student-volunteer-run cafe, UBC Sprouts, which repurposes the donated food and serves it in their weekly by-donation Community Eats. The food donations allow UBC Sprouts to serve community members a low-cost meal while reducing potential food waste. The creation of food recovery guidelines will help to guide UBC Food Services towards an improved food recovery system.

1.2 RESEARCH RELEVANCE

Food waste is a multidisciplinary issue with social, economic, health, and environmental impacts. The global Sustainable Development Goals set by the United Nations are set to address global challenges that have social, environmental, and economic impacts (United Nations, 2015). This includes the goal to halve food waste, as almost one third of food produced is wasted (United Nations, 2015; FAO, 2013). When uneaten, edible food ends up in a landfill, it decomposes and subsequently releases methane, a potent greenhouse gas that contributes to climate change (Jaglo et al., 2021). Research pertaining to food recovery, like implementing a food recovery pilot program in a living-lab setting, such as a campus dining hall, can therefore contribute to global initiatives and goals while providing scalable results to improve food systems.

Food recovery has additional benefits and can contribute to food security. In Canada, over half of the food produced is lost or wasted (Second Harvest, 2019). Discarded food contributes to more than half of the Canadian food industry's CO2 equivalent footprint (Second Harvest, 2019). Concurrently, 12.7% of households in Canada experienced food insecurity in 2018 (Tarasuk & Mitchell, 2020). Food insecurity is a pressing public health issue in Canada. Canadians who experience food insecurity are more likely to suffer from chronic health conditions and poor mental health compared to those who are food secure (Tarasuk & Mitchell, 2020).

Similar trends occur on UBC's campus. The UBC campus food system falls into the University's second-highest emissions category, releasing around 29,000 tonnes of CO2 emissions per year (UBC Board of Governors, 2021). Despite the vast amount of food waste on campus, 38.5% of UBC students identify as food insecure (Carry et al., 2019). Food insecure students may experience lower productivity, which can lead to a lower GPA, contributing to an increased likelihood of leaving university without completing a degree, thereby affecting long-term employment opportunities (Martinez et al., 2018). Our project addresses both the issue of campus food waste and student food insecurity through a campus food system food recovery model. By recovering food, we are redirecting it from landfills to those who can benefit from having access to it, thereby helping to improve campus food security.

1.3 PROJECT CONTEXT

While there are various campus initiatives who work to support student food security and increase sustainability through composting food scraps, there is not as much focus on the food recovery aspect. Campus food security initiatives include the UBC Meal Share Program, UBC Food Security Initiative, AMS Food Bank, UBC Food Asset Map, UBC Seeder, and Fooood Cafe. The first project to address food recovery on the UBC campus occurred in 2017, through a piloted food recovery from 18 UBC Food Services locations directed by an LFS 450 group (Lu et al., 2017). More recently in 2020, UBC Food Services and AMS Catering partnered with the SEEDS Sustainability Program and the AMS Food Bank on an AMS food recovery program to provide additional support and alleviate immediate food insecurity while reducing food waste (D. Speight, personal communication, January

27, 2022; Woo et al., 2020). However, this AMS Food Recovery Program encountered challenges and was thus unable to continue due to the Food Bank's lack of capacity to sustain the donations and handle perishable foods (D. Speight, personal communication, January 27, 2022).

In October 2021, UBC Food Services launched a new initiative: the UBC Food Recovery Pilot Program, aimed at tackling food insecurity and reducing food waste. This Pilot Program is in line with the UBC Food System Project's (UBCFSP) Food Action Framework and the Campus Food Waste Prevention and Reduction Strategy's priority for a more sustainable campus food system by increasing food security and recovering food across campus (UBC Food Systems Project Committee, 2017). The three key stakeholders actively running this Food Recovery Pilot Program are UBC Food Service's Open Kitchen Residence Dining Hall, Seeder at Enactus UBC, Community Eats at UBC Sprouts, and Seeder at Enactus UBC.

Through the UBC Food Recovery Pilot Program, UBC Food Services will be distributing rescued food from Open Kitchen Dining Hall. Open Kitchen is UBC Food Services' newest and highest-volume residential dining hall at Orchard Commons Residence that serves a variety of international foods to the UBC community and the public (University of British Columbia, 2022). During the week, any surplus food is collected by Open Kitchen staff and is set to be delivered to their recipient organization, Community Eats, which is run through UBC Sprouts.

Delivery is done through a UBC student-led club called Seeder. Seeder is a food waste reduction project created by Enactus UBC that aims to provide a centralized hub for food recovery resources and solutions to food waste (Enactus UBC, 2020). Seeder acts as the liaison between Open Kitchen and Community Eats and notifies the recipient whenever there is recovered food for donation. An alternative delivery method to get surplus food from Open Kitchen to Sprouts when Seeder volunteers are not available is through Vancouver Food Runners, a local volunteer-based organization that partners with businesses to drive donated food to recipient organizations.

The recipient of recovered food, Community Eats, is an initiative organized by UBC Sprouts that strives to decrease edible food waste while building community awareness through a weekly by-donation meal (UBC Sprouts,

n.d.). Every Friday, Community Eats provides vegan/vegetarian meals to hundreds of people on campus (UBC Sprouts, n.d.). Community Eats also receives rescued food from off-campus outlets. By using this location, food diverted within the UBC Food Recovery Pilot Program will go directly to feed students within the UBC community, support the food security on campus, and lower carbon gas emissions related to transportation.

1.4 PROJECT PURPOSE, GOALS AND OBJECTIVES

PROJECT PURPOSE

The aim of this research is to advance food recovery programs that reduce food waste and promote food security on the UBC campus.

RESEARCH GOALS

- Evaluate the UBC Pilot Food Recovery Program's feasibility in reducing food waste and increasing food security on campus.
- Create a guideline that includes identification of focus areas, priorities, and recommendations that will inform the development of a Campus Food Recovery Strategy.

RESEARCH OBJECTIVES

- Identify promising practices and challenges of programs that have demonstrated success in operating food recovery programs that reduce food waste and promote food security.
- Assess the impacts, costs and benefits, and challenges of the UBC Food Recovery Pilot Program.
- Identify focus areas, priorities, and recommendations to create a guideline which will inform the development of a Campus Food Recovery Strategy.

2. METHODOLOGY AND METHODS

2.1 RESEARCH METHODOLOGY

Our project applied a Community-Based Action Research (CBAR) framework which is a research methodology that takes place within a specified community and involves community members as active participants (Strand et al., 2003). CBAR involves the principle of collaboration between researchers, project

partners, and community members to address shared research priorities while building toward social change (Clark & Ventures, 2016). Following this framework, our project purpose, goals, and objectives were developed collaboratively with our project partners and our SEEDS representative in order to conduct research that addressed the shared priority of advancing campus food recovery which will ultimately contribute to campus food security.

We used the principles of CBAR to guide our research. A key principle of CBAR is the recognition that knowledge can come from diverse sources and methods of discovery (Strand et al., 2003). We practiced this principle by employing both primary and secondary research methods to obtain an in-depth understanding of the issue from multiple perspectives. In doing so, we reached out to established food recovery programs in our primary research. Furthermore, we intentionally contacted people from varying levels of seniority in these programs, from program directors, delivery drivers, and kitchen staff. Finally, the principle of community action in this methodology encouraged us to consider how what we learned at every step of the project, from our primary data interviews and our secondary data environmental scan, could help inform future actions that UBC Food Services employ to facilitate food recovery.

2.2 RESEARCH METHODS

Our research methods included both primary and secondary data collection. An environmental scan of secondary data was conducted along with primary research interviews with relevant stakeholders.

2.2.1 SECONDARY DATA COLLECTION RESEARCH METHODS

Our Secondary data collection involved an environmental scan to identify prominent food recovery programs. This was to both help inform whom we reached out to for an interview in our primary data collection, and to gain an understanding of current challenges and promising practices associated with food recovery programs. This process involved searching for existing food recovery programs in Canada and the U.S., with an emphasis on collecting information from food recovery programs at post-secondary institutions.

We also reviewed existing literature on topics broadly related to food recovery and food waste to get a sense of prominent challenges and their subsequent solutions. To search for peer-reviewed sources related to food recovery programs and strategies, we used keywords like "food waste," "food recovery," "food recovery policies," "food recovery program" + "campus," and "food rescue" + "challenges." Our inclusion criteria were focused on finding resources on programs that were impactful, innovative, and scalable. We searched for this secondary data material through the UBC Library, the Association for the Advancement of Sustainability in Higher Education (AASHE), websites of institutions of higher education, and the EAT-Lancet Commission on Food, Planet, and Health.

2.2.2 PRIMARY DATA COLLECTION RESEARCH METHODS

Primary data collection was conducted via semi-structured online Zoom interviews. Interviews were selected as the method of data collection to gain information through an informal yet personable approach. Interviews were held over Zoom in accordance with local public health guidelines regarding COVID-19. Although interview scripts were established, they were not strictly enforced, allowing for a level of flexibility to ask relevant questions not specified by the script. All interviewees were recruited by email communication. They were sent a brief overview of the project and encouraged to submit their interview availability through a Doodle poll (Refer to Appendix A and B for interview schedules, recruitment strategy, and outreach emails.

Our group had two research goals in mind when recruiting interviewees: First, we sought to gain insight into current food recovery operations, strategies and guidelines within UBC. Interviewees who could provide such information were identified based on their involvement in or proximity to the UBC Food Recovery Pilot Program and from recommendations made by our UBC SEEDS representative, Laure Dupuy, and UBC Food Services Client Liaison, David Speight. We contacted relevant members of UBC Food Services, Open Kitchen, UBC Seeders, Community Eats (run through UBC Sprouts), VFR, and AMS Catering. These interviewees were categorized as being involved with the UBC Pilot Food Recovery Program. While AMS catering is not directly involved with the Pilot Program, we included them in our primary interviews as they had relevant insights and potential role to play in

food recovery on campus.

The next goal was to understand the logistics of notable food recovery programs operating at post-secondary institutions within Canada and the United States. These programs were identified through our environmental scan. We chose to contact representatives from food recovery initiatives affiliated with post-secondary institutions in Canada and the U.S. that appeared reputable and impactful and that provided a contact email we could use to initiate conversation. Of the ten program representatives contacted, four of them responded. These included representatives from Washington State University (WSU), University of California San Diego (UCSD), Colorado State University (CSU), and MealCare. These interviewees were categorized as "external" as they were not directly affiliated with UBC's food recovery efforts.

Detailed notes of each semi-structured interview session were recorded as the interview was happening, apart from communication with a representative from the UCSD, which took place via written email communication. These summaries were then reviewed to identify key themes of both initiatives involved in UBC's food recovery pilot program and food recovery programs from other institutions.

An Excel document was then used to group key points from each interview into three broad categories: successes, challenges, and goals that each operation had experienced in terms of their food recovery efforts. Excerpts from the interview notes that corresponded to these categories were then copied and pasted into Excel. From there, sub-themes of these interview excerpts were identified. For a sub-theme to be identified, it had to be mentioned at least three times throughout our sorted interview excerpts.

2.3 METHODS OF ADMINISTRATION

The interview recruitment and administration process took place between weeks six to eight of the project. On week six, recruitment emails were sent to our list of potential interviewees (refer to Appendix B for recruitment email). They were sent a brief overview of the project and were encouraged to submit their interview availability through a Doodle poll. A consent form was attached to be signed prior to the interview within our

recruitment email. On weeks seven and eight, we conducted remote interviews using Zoom. We administered different interview questions depending on whether the interviewee was associated with UBC (i.e., UBC Food Services, AMS Catering), or if they were from an institution not affiliated with UBC (see Appendix C for interview questions).

The data collection method for all interviews involved transcribing typed notes onto Microsoft Word to give space for the interviewee to freely express their thoughts and opinions on their work/programs. Interviewing also allowed us to ask open-ended questions and receive a comprehensive response with room for follow-up questions. Zoom interviews were conducted rather than a survey as we felt we could gain more complex insights and ask follow-up questions not on our script through conversational interviews. In-person interviews were not feasible due to both the differences in geographical locations as well as personal health and safety concerns with the pandemic.

3. RESULTS

3.1 RESULTS OF SECONDARY DATA COLLECTION

Through our secondary research, we identified shared challenges and promising practices faced by food recovery operations, and highlighted exemplary programs in the food recovery field operating in Canada and the United States.

3.1.1 CHALLENGES

From our literature review, we identified key challenges to food recovery, as represented in Table 1. Prominent challenges included issues concerning the pick-up logistics of recovered food, lack of funding and staffing, concerns over food safety procedures, as well as considerations of the quality of food being recovered and subsequently donated.

Challenges	Examples from literature
Food pickup logistics	Difficulties with coordinating the packaging, storing, picking up, and delivering of food (Benson et al., 2018; Bierma et al., 2019)
Funding	Lack of funds limiting storage space, transportation methods, and staff (Benson et al., 2018; Bierma et al., 2019)
Staffing	High turnover rate of volunteers leading to time wasted in training and inconsistent operations (Benson et al., 2018; Otten et al., 2018)
Food safety	Lack of training in donation procedures and food safety regulations (Benson et al., 2018; Bierma et al., 2019)
Quality of food	Low quality or nutritional value of donated food (Tarasuk et al., 2005; Wingrove et al., 2017)

Table 1. Summary of top challenges to managing food rescue operations.

3.1.2 PROMISING PRACTICES

We identified promising practices supporting food recovery in the literature. First, a frequent practice regarding food pick-up logistics included freezing food to prolong the shelf life (Bonaccorsi et al., 2016). Furthermore, to make the food recovery process more organized, many organizations used web-based tracking applications (Sewald et al., 2018). To address a high turnover rate and the wasted training time and inconsistent operations associated with it, a promising practice found in literature was to use open-source software that automated volunteer scheduling, data recording, and provided instructions on food recovery procedures (Sewald et al., 2018). Regarding the issue of training staff and volunteers for food safety procedures, this was addressed in the literature by involving food safety inspectors and developing food safety training for food rescue volunteers (Garcia-Silva et al., 2017). Lastly, the poor quality or nutritional value of donated food was another concern (Hecht & Neff, 2019) but was addressed by either freezing food (Bonaccorsi et al., 2016) or providing more fresh fruit and vegetables (Mirosa et al., 2016).

3.1.3 EXEMPLARY PROGRAMS

In our secondary research, we came across many different food recovery programs we could learn from.

Prominent food recovery programs or organizations and a description of what they do are summarized in table 2.

Educational Institution	Program	Description
Colorado State University	Rams Against Hunger	Services include a food pantry, a food donation program (mealswipe), food pantries, and in-person assistance with navigating federal aid eligibility (Backman, Dollard, & Miyamoto, 2020).
	On-Campus Mobile Food Pantry	Students receive a box of non-perishable whole foods and dairy products once a month on the mobile food distribution day on campus (Backman, Dollard, & Miyamoto, 2020).
	RamRide Food Ops & Friday Food Bank	Provides free rides to and from food pantries (Backman, Dollard, & Miyamoto, 2020).
University of Guelph	MealCare	Volunteer members package, record donated foods in pounds, and distribute leftover meals from university dining halls to the student food bank and off-campus organizations (Hospitality Sustainability U of G, n.d.). They also share food rescue data with food donors to identify opportunities to reduce food waste in the future.
Washington State University	WSU Food Recovery Program	Student volunteers repackage leftover food items from dining services into individual portions, which are distributed to community members in need through the Community Action Center food pantry.
Founded at University of Maryland, College Park, Operates at 200+ campuses across the U.S.	Food Recovery Network	The largest student-led food recovery program in the US, operating at over 200 campuses across the U.S. FRN collects "surplus food from campus dining halls, food vendors, restaurants, and farms" and distributes them to non-profit organizations combating hunger (Food Recovery Network, 2019; Food Recovery Network, 2021; The FRN National Team, n.d.).
N/A	MealConnect with Feeding America	Donors can enlist surplus food on a mobile app called MealConnect whose algorithm determines the optimal recipients, be it Feeding America food bank or local food program, so staff can come and pick up food for distribution (Dixon, 2019).
Simon Fraser University	Embark Sustainability	Retrieves imperfect looking, edible produce from the grocery store and distributes it by donation to SFU community members (Embark Sustainability, 2021).

Founded by California State University	Swipe Out Hunger	A campus organization that allows students to donate up to three swipes per week, of which 80% is converted into meal vouchers for students in need and the rest is "converted to a monetary value, which is used to purchase food for local shelters" (Swipe Out Hunger, 2021).

Table 2. Organizations and programs that address community food insecurity and food waste.

3.2 RESULTS OF PRIMARY DATA COLLECTION

Of the 10 non-UBC affiliated food recovery programs we reached out to, four responded. All UBC-affiliated representatives agreed to interview. From our interview notes, nine sub-categories were identified. These included food pickup logistics (which had to do with when and how often food could be picked up from a kitchen based on the availability of kitchen staff and volunteers), funding (both in terms of funding staffed positions and for food infrastructure like refrigerators), food safety/liability concerns, transportation logistics for food donations, food storage logistics, campus food policies or guidelines, volunteer yield (encompassing volunteer recruitment and sustainability), food waste reporting, and food recovery awareness. For details of our primary data results, refer to Appendix D.

As illustrated in Figure 1, themes related to food pickup logistics were mentioned 17 times, followed by transportation logistics (11 mentions), food safety/liability (11 mentions), funding (11 mentions), food storage logistics (10 mentions), then volunteer yield (9 mentions), food policy/guidelines (5 mentions), food waste reporting (4 mentions), and finally, food recovery awareness (3 mentions).

Number of times subcategories were mentioned by food recovery organizations
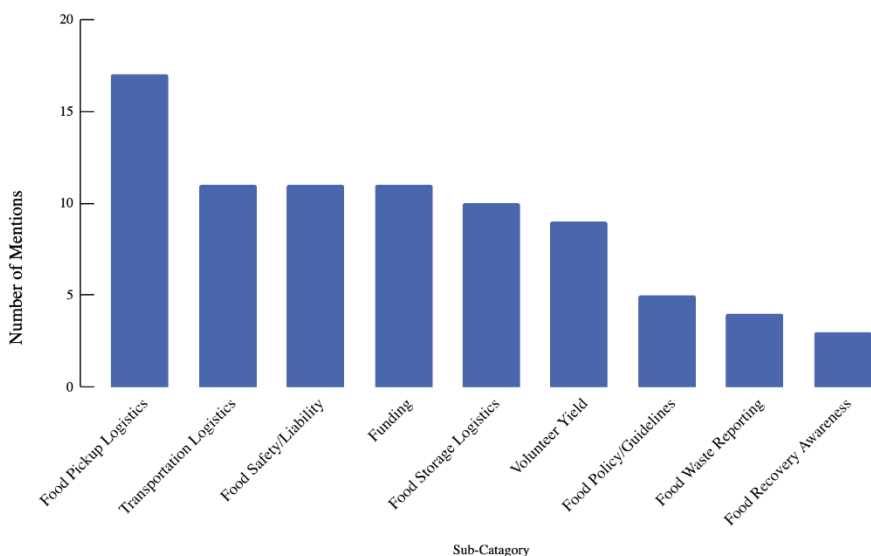

Figure 1. Frequency of Sub-Category Mentions Across Interviews

3.2.1 FOOD PICK-UP LOGISTICS

Of all sub-categories, food pickup logistics was the most mentioned among interviewees. Food pickup logistics was mentioned in eight of the ten interviews and was mentioned more than once in six of them. For example, our interview notes detail one account of a UBC Open Kitchen representative who mentioned food pickup logistics by highlighting that "streamlined communication between staff and management team is key to ensuring smooth operation while raising awareness of food waste prevention" (B. Bogart, March 7, 2022). Similarly, a representative from UBC Seeder noted that "pickups aren't consistent so it's hard for volunteers to schedule consistently" (J. Hernandez, personal communication, March 10, 2022).

3.2.2 TRANSPORTATION LOGISTICS

Transportation logistics was a concern for five of the ten interviewees. In our interview with Jessica Hernandez from UBC Seeder, she mentioned that she was the only volunteer with a car and that there is "no transport if volunteers can't drive" (personal communication, March 10, 2022). Although she mentioned a previous partnership with Modo, a car share service, cars could be had to find and not always a reliable source of

transportation. On a different note, VFR stated that their app addresses transportation logistics by having volunteers with cars sign up and providing these volunteer drivers with "built-in navigation, [information on] where to go and park, who to contact, and what to record to complete delivery procedure" (M. Reining, personal communication, February 28, 2022).

3.2.3 FOOD SAFETY/ LIABILITY

Concerns around the food safety of recovered food donations and the liability of those who donated it was topic of discussion in half of our interviews. Alice Ma from WSU indicated that "a sample of food donated is kept in the freezer in case people get sick so they can go back and test the food," although ongoing "concerns regarding liability and risk of donating food" remain (personal communication, March 2, 2022). Other food safety strategies were reported in our interview with CSU regarding their recovery of catered food, including how local public health authorities asked that those who wanted to receive donated food "arrive with clean containers, [and] catering staff serves the food to them" (T. Miyamoto, March 10, 2022). Regarding concerns over food liability, CSU utilizes a program where students who want to receive recovered food from catered events sign up for mobile notifications. In doing so, they are asked to "sign a Good Samaritan Act waiver prior to signing up on the website. [The waiver] says they will not hold the university accountable for taking leftover food that has once been served" (T. Miyamoto, March 10, 2022).

3.2.4 FUNDING

Funding was a topic mentioned by 6 interviewees. David Speight and Darren Clay from UBC Food Services emphasized not being able to incur the extra costs need for more hours worked by staff (personal communication, January 26, 2022). Another finding on this theme came from UCSD, who incorporated their food recovery club into their campus' Hub Basic Needs Center, a resource centre dealing with issues related to student food security (A. Ilustrisimo, personal communication, March 9, 2022). UCSD's Hub Basic Needs Center supports

the school's food recovery club by providing infrastructure, staff supervision and training for students, as well as student employment opportunities (A. Ilustrisimo, personal communication, March 9, 2022).

3.2.5 FOOD STORAGE LOGISTICS

Concerns regarding food storage logistics were mentioned by six interviewees, most notably by Alice Ma from WSU. Alice mentioned that they have had to work around how to store recovered food, stating "most of the food recovered and donated is hot food. Food is stored in large containers until someone from the food pantry comes to pick it up [every Tuesday]. Volunteers at the food pantry package the items into individual containers and the food is then refrigerated or frozen" (personal communication, March 2, 2022). She also noted that "The campus opened up a campus food pantry that has fridge space, so the dining service can donate the ready to go/ market items on campus so food stays on campus" (personal communication, March 2, 2022).

3.2.6 VOLUNTEER RECRUITMENT AND SUSTAINABILITY

Both volunteer recruitment and long-term sustainability were mentioned by half of all interviewees. David Speight and Darren Clay voiced concerns over volunteer retention and long-term engagement with students graduating (personal communication, January 26, 2022). Michelle Reining from Vancouver Food Runners also discussed this theme, sharing that their program has 1600 volunteers that can easily sign up through their app and follow the rescue instructions (personal communication, February 28, 2022).

3.2.7 CAMPUS FOOD POLICY/GUIDELINES

Campus food policies or guidelines were discussed in four interviews. In our interview with CSU, Tonie Miyamoto stated that they "rewrote [their] campus food policy in consultation with public health officials so food that has been served can be donated" (personal communication, March 10, 2022). Regarding guidelines, Milton, the founder of MealCare which has chapters at 8 Canadian post-secondary institutions, offers overall guidelines

that their university chapters can take, but also encourages flexibility and adaption of these guidelines to the context they are intended to function in (personal communication, March 3, 2022).

3.2.8 FOOD RECOVERY AWARENESS

Food recovery awareness was mentioned in three interviews. Michelle Reining highlighted the "lack of awareness of food recovery in the food industry," while Brian Bogart at Open Kitchen emphasized a "lack of awareness of the food recovery program at staff level" in their kitchen (personal communications, February 28, 2022; personal communications March 7, 2022).

3.2.9 FOOD WASTE REPORTING

Food waste reporting was brought up in four interviews. Alice Ma from WSU told us that "both the food pantry and the dining service record how much they donate in weight or numbers of meals to measure impact of recovery" (personal communication, March 2, 2022). Similarly, the app VFR uses an app that "tracks recovery metrics [like] weight and type of food, number of meals distributed, [and] CO_2 mitigated" (M. Reining, personal communication, February 28, 2022).

4. DISCUSSION

Results from primary and secondary data collection provided valuable insights into the successes and challenges of food recovery programs. Furthermore, the results captured from our interviews were supported by research from our environmental scan and confirmed that there are co-benefits to implementing a food recovery program including addressing food waste and food security.

4.1.1 LABOUR COSTS

Discussion around labour costs was common in both our primary and secondary data results, as food services operators must balance the importance of food recovery with running a business. The labour cost of extra training, recovering, and packaging surplus food, and coordinating pick-up logistics was a common barrier faced by businesses interested in participating in food recovery programs (D. Speight, Personal Communication, January 27, 2022; C. Halonen, Personal Communication, March 10, 2022.)

We raised this concern with our interviewee, Tonie Miyamoto, at CSU, where their food recovery initiative, the Ram Food Recovery Program, has been running on their campus for several years (Personal Communication, March 4, 2022). We learned that Ram Food Recovery's process allows for catering staff to log the food into an online program before the end of the catered event and send out a mass text to registered participants (T. Miyamoto, Personal Communication, March 4, 2022). This texting feature was highlighted as an efficient method of organizing food pickup from catered events, ensuring that staff only need to stay half an hour after the event while students pick up food. During this half-hour, they are also cleaning up after the event, so this added role and time did not create an issue for staff (T. Miyamoto, Personal Communication, March 4, 2022). A time-saving communication system like this has the potential to address the concerns of our clients regarding labour costs and can be considered when looking into streamlining food recovery processes.

4.1.2 VOLUNTEER YIELD

The active recruitment and involvement of student volunteers in food recovery programs was ultimately seen as an asset, although not without some challenges to volunteer sustainability. On one hand, student volunteers are passionate about the cause and reduce labour costs. Furthermore, volunteering provides valuable leadership positions related to food recovery on campus. On the other hand, a potential barrier presents itself in the form of long-term sustainability, given that student volunteers will eventually graduate (C. Halonen, March

10, 2022; D. Speight, personal communication, January 27, 2022; Hecht & Neff, 2019; J. Hernandez, personal communication, March 10, 2022; M. Calderon, March 4, 2022; Wu et al., 2020).

At UBC Seeder, there are currently only 9 student volunteers on the team. As food pick-ups are usually coordinated with short notice, student volunteers cannot always be available within the specified timeframe. As a result, their leader, Jessica Hernandez, takes on the brunt of the work (J. Hernandez, personal communication, March 10, 2022). While Jessica mentioned that finding volunteers to sign up for this initiative was not an issue, finding volunteers with a flexible enough schedule to accommodate the occasional pickups was difficult. UBC Seeder will continue the program into the 2022-2023 school year and there will be a hiring process to recruit new leaders for the initiative. However, there are uncertainties in terms of whether there will be someone as consistent as Jessica, since Seeder also relied mostly on her car for transportation of donations (J. Hernandez, personal communication, March 10, 2022). With this information, it is likely that UBC Food Services can predict another year of sporadic food pickup by volunteers from UBC Seeders, especially with Jessica graduating and transportation becoming increasingly uncertain. As such, food donations from Open Kitchen should be consistent so that volunteers can have consistent pickup schedules. Open Kitchen can also consider incorporating other means of food donation pickup to diversify its volunteer base.

4.1.3 STAFF EDUCATION AND AWARENESS

A common theme among food recovery programs is the importance of educating staff on food recovery procedures, as well as on the program itself. In our interview with Brian, the Open Kitchen first cook, he noted that not all staff are on the same page as to what the recovery program is, what can be donated, the donation preferences of the recipient UBC Sprouts, and who to contact for pick up (personal communication, March 7, 2022). Similar concerns revealed themselves in other primary interviews. For example, Milton Calderon from MealCare highlighted the importance of clear communication on program procedures and guidelines between dining hall staff and those running the program to support sustainability and transparency (personal

communication, March 4, 2022). To this point, the WSU food recovery program facilitates communication and knowledge sharing between their food-safe certified staff and the volunteers in the recovery program while food is being repackaged, stored, and distributed (Washington State University, n.d.; A. Ma, personal communication, March 2, 2022). Open Kitchen could subsequently incorporate a similar approach.

4.1.4 FOOD SAFETY / LIABILITY

Concerns around food safety and liability came up frequently throughout our interviews, and was a challenge highlighted in our environmental scan (Benson et al., 2018; Bierma et al., 2019). As such, they must be addressed if a food recovery program is to be implemented successfully. A previous LFS 450 project that worked on the AMS Food Recovery Strategy recommended the use of waiver forms for AMS Catering to remove the barriers to food recovery associated with liability issues (Wu et al, 2021). However, upon interviewing Christine Halonen from AMS Catering, we found that the recommendation had not yet been implemented (personal communication, March 10, 2022). Barriers to implementation that were identified included the cost of training, hiring extra workers, and coordinating a new program, all while facing staffing shortages due to the COVID-19 pandemic (C. Halonen, March 10, 2022), which were themes consistent with the results of Benson et al. (2018) and Otten et al. (2018).

Conversely, CSU's food recovery program has actively addressed barriers to food safety and liability. They incorporated a mandatory waiver form for students to sign in order to access the program, which addressed concerns over liability. Previously, their campus food donation policy prohibited donations of serviced foods leftover from catered events, so they changed their on-campus policy to include them as viable donations (T. Miyamoto, personal communication, March 4, 2022). The program also addresses food safety concerns by setting a pickup time very soon after a catered event and deals with labour shortages and costs by integrating the food recovery process into the cleanup and take-down procedures after an event. The Ram Recovery Program at CSU was one of the first programs we found that recovered catered food in this manner.

Another way to address food safety concerns that came up in our interview with WSU was the practice of keeping samples of recovered food for future testing. WSU's Community Action Center Food Pantry recovers a mix of grab-and-go items (i.e., prepackaged sandwiches), hot foods, and canned foods from their dining services (A. Ma, personal communications, March 2, 2022). To ensure they donate safe-to-eat food without being held liable for food-borne illness, they keep a sample of each food item in the freezer for testing in case someone gets sick. A process like this would rely on the adequate training of kitchen staff, as highlighted by Benson et al. (2018). The insights gained from our interviews and environmental scan suggest there are many challenges regarding the safe donation of recovered food, as well as dynamic solutions to address them that depend on staffing, adequate training and staff knowledge, and campus food policies.

4.1.5 FOOD RECOVERY LOGISTICS

Food recovery programs commonly benefited from a long-term coordinator as well as a unified program plan. For example, the WSU food recovery program is led by staff coordinator Alice Ma, a registered dietician who oversees the recovery of food, is a point of contact for their campus food pantry, and who receives the food and helps coordinate volunteers (A. Ma, personal communication, March 2, 2022). In her role, Alice works with key stakeholders in the campus food services to create the "WSU Food Recovery Program and Policy Document" which outlines the programs vision, food recovery guidelines, and transportation logistics. Even though the program also struggled with labour and volunteer shortages during the pandemic, having Alice in a coordinator role helped the program survive the uncertainty of the time and adapt. Furthermore, student volunteer turnover rate became less of a barrier given that there was a long-term coordinator to keep the program moving forward.

Based on our research, streamlined forms of communication, typically through using technology, is another vital component to a smooth-running food recovery logistics plan. Incorporating the use of technology into communication, such as messaging apps or texting, allows for instant communications between multiple parties. The Ram Food Recovery at CSU uses a web-based platform to notify students through text messaging that

there is leftover food they can pick up at the end of a catered event. This texting feature effectively streamlines the communication process between the catering team and recipients, as it is reliable and consistent. (T. Miyamoto, personal communication, March 4, 2022). Another form of technology utilized comes in the form of an app that matches the donor and recipient as used by VFR and MealConnect through the Food Rescue Hero App (M. Reining, personal communication, February 28, 2022). This app technology easily tracks metrics like pounds of food recovered, meals distributed, and carbon dioxide mitigated, and the reports can be shared back to the restaurants and food service businesses for their insight (M. Reining, personal communication, February 28, 2022).

4.2 DATA LIMITATIONS:

One limitation we faced when gathering our data for this project is that the UBC Food Recovery Pilot Program was still in its initial phases. We were unable to personally observe the program in action and only gathered information through interviews with those involved in it. While we tried to ask questions that would capture valuable information about the program, it is possible that we missed some information that may have only come up through seeing or participating in the program. As well, the program is not run regularly but only when there is surplus food from UBC Food Services that is identified as recoverable. This is a good thing, as it means that UBC Food Services is focused on their priority of reducing food waste and repurposing food. In terms of our data, since the program does not run very often, some of the challenges and barriers we identified may be just initial ones, and others may arise as the program runs more frequently and establishes itself more fully.

5. RECOMMENDATIONS

Below are actionable steps that UBC Food Services and Open Kitchen can implement based on our findings. The timeline for recommendations is immediate (implemented within a year), mid-term (implemented within one to two years), and long-term (implemented in two years or more). Our recommendations are meant to

aid UBC Food Services in solidifying the UBC Food Recovery Pilot Program to ensure long term sustainability of food recovery on the UBC Campus. We hope that they also provide relevant information and considerations that will aid in the future development of a Campus Food Recovery Strategy.

5.1 IMMEDIATE RECOMMENDATIONS

Our immediate recommendations encompass actions that UBC Food Services can take straight away to improve program coordination and staff education. These recommendations can occur immediately and be carried over during UBC Food Services' switch to an All-Access Dining Program.

5.1.1 DEVELOP A MISSION STATEMENT

First, we recommend that a mission statement for the program be developed. Creating a mission statement is a way to clearly establish the purpose of the program, which can then guide actions taken. Mission statements can help all project partners see the meaning of their work and how it contributes back to a larger goal, thereby boosting morale and long-term investment in the program.

Sample Mission Statement

The UBC Food Recovery Pilot Program is dedicated to the recovery of edible surplus food from UBC Food Services dining hall locations to be further distributed to the UBC Campus community in order to achieve the co-benefits of reducing food waste and increasing student food security.

5.1.2 STREAMLINING COMMUNICATION BETWEEN PROJECT PARTNERS

Accessible communication between all partners can help support a smooth food recovery process. To do this, we recommend that a streamlined communication system between leaders at UBC Food Services, UBC Seeder, UBC Sprouts, and SEEDs Sustainability representatives be created. This could be done through a Microsoft

Teams chat, a What's App group, or a Slack channel. Once a communication system is set up, project partners can also set meetings with a frequency that works for those involved, perhaps on a monthly or bimonthly basis, to discuss the program logistics and opportunities for improvement. An accessible communication will allow for quick, real-time feedback and observations to be gathered from staff and volunteers involved in the program. For example, leaders at Sprouts Community Eats can offer quick feedback on the food recovery process and on the recovered food itself. As well, it will help allow for more flexible pick-up and drop off times, as everyone is notified in real time about potential donations. An example of a potential communication procedure can be found in Appendix E.

5.1.3 SOLIDIFYING PROGRAM LOGISTICS

As UBC Food Services makes the transition to All Access Dining, there is a need to solidify the logistics of how food will be recovered in this new model. Fortunately, this switch offers an opportunity to reinforce the food recovery process and include it in new staff training. UBC Food Services can take advantage of this new training to incorporate messaging about the UBC Food Recovery Pilot Program, including the logistics of the program, what food can be recovered, and how transportation is coordinated. Based off our interviews and research on other campus food recovery programs, we have suggested a sample plan below. See appendix E for visual examples of these logistics.

Potential Food Recovery Logistics

1. First cooks identify potential recoverable food

2. First cooks talk to their shift leads to see if the food fits the donation criteria

3. Food is packaged, labeled, and stored in the appropriate location

4. Shift leads (who have knowledge of what can be donated), post a photo and description of the food on the designated communication platform for UBC Seeder and Sprouts volunteers

    a. Shift leads specify time window for pick-ups that work for UBC Seeder volunteers

5. A UBC Seeder volunteer that is free for pickups will respond to the post and pick up within the specified time frame

6. UBC Seeder volunteer notifies UBC Sprouts shift leaders when the donations will be dropped off

To streamline the process, UBC Sprouts or other donation recipients could specify a time frame for regular drop offs throughout the year and send a contact list of their shift leads. In this potential logistics plan, we suggest that shift leads be involved in the food recovery process. However, we recognize that kitchen staff have many responsibilities, so it would be ideal for someone with a designated task of both measuring food waste and coordinating food recovery and donations, which is further discussed in our long-term recommendations.

5.1.4 TRACKING & MONITORING FOOD WASTE AND RECOVERY METRICS

Monitoring food waste and tracking food recovery metrics is an important part of understanding the impacts of a food recovery program. Open Kitchen can record food waste and recovery metrics to track the total weight and the cost of all food waste as well as the food that could have been donated but was wasted instead. As a deliverable to this project, we have provided an Excel sheet to track total food waste, total food that was recovered, and total food waste that could have been recovered but was discarded instead. Refer to Appendix F for a screenshot of the Excel spreadsheet template.

Alternatively, another way to start the process of tracking recovered food donations would be to take pictures of each donation and upload it to the streamlined communication method for transparency of date, time, and a visual of what is being donated (i.e., WhatsApp).

Finally, another potential way to streamline the process of monitoring food recovery metrics could be to take advantage of the technology that VFR currently uses. The Food Rescue Hero app enables food donors to track pounds of food collected, type of food recovered, meals distributed, and carbon dioxide mitigated (M. Reining, Personal communication, February 28, 2022). This form of tracking could be used alone, or in conjunction with another method, like the Excel document mentioned above.

5.1.5 CREATING AND SHARING IMPACT REPORTS

Once there is an efficient system for recording and tracking food recovery metrics, impact reports can be created and shared. A visual and numerical record of the impacts of the UBC Food Recovery Pilot Program can be used to justify future funding opportunities as it showcases the importance of having a campus food recovery program at UBC, thereby supporting the program's longevity.

5.1.6 INCREASING STAFF AWARENESS & EDUCATION

Coinciding with improving program coordination, increasing staff awareness about the program would also have positive effects. This recommendation stemmed from our interview with Brian from Open Kitchen, who emphasized that all levels of staff could benefit from learning about the food recovery program and the food recovery process (personal communication, March 7, 2022). This includes education on what food can be donated, the process of food recovery, storage and recipient information, and the positive impacts of the food recovery program on the student community. Brian also mentioned that training with First Cooks in the kitchen would be a great starting point. Increased awareness among all levels of staff would bring more transparency and collaboration, hopefully promoting the programs longevity.

5.2 MID-TERM RECOMMENDATIONS

5.2.1 INCREASING THE PRESENCE OF VANCOUVER FOOD RUNNERS ON THE UBC CAMPUS

Our mid-term recommendation is to encourage and facilitate the presence of Vancouver Food Runners on the UBC campus. For UBC's Food Recovery Program to be sustainable in the long run, there needs to be a reliable source of volunteers and transportation. Our meeting with Michelle Reining, Executive Director of Vancouver Food Runners highlighted the potential of VFR to help fill this gap, as they are a well-established organization involved in food recovery and can sustainably provide volunteers and transportation. Currently, the program relies on the UBC Seeder representative, Jessica Hernandez, who uses her personal car to pick up the

recovered food. Once Jessica graduates, it is not guaranteed that there will be a reliable method of transporting the recovered food. UBC students can still be involved in the process by signing up as volunteers through Vancouver Food Runners and it mitigates potential costs of renting a car or using car sharing services in case the students involved do not have access to a car. Recovered food can still stay on the UBC campus, as Vancouver Food Runner's volunteers can transport food from UBC Food Services to UBC Sprouts and even other campus food security resources.

To start a partnership, UBC Sprouts can sign up as a receiving organization with Vancouver Food Runners. This can create an outline for how other campus food outlets could utilize Vancouver Food Runners, thereby keeping recovered food within the UBC community and helping to divert food waste across campus.

5.2.2 INCORPORATION OF THE RECOVERY OF CATERED FOOD IN FOOD RECOVERY GUIDELINES

Next, we recommend that future food recovery guidelines include the recovery of catered food from UBC FS. Currently, one barrier to recovering catered food is the concern over food safety and liability. Food guidelines that incorporate the use of waiver forms for food recipients could address this initial concern. From our research, we learned that Colorado State University found it beneficial to re-write their campus food policy to allow for the donation of catered foods. In addition to this policy change, they have all participants sign a waiver form online prior to registering for text-messages. The catering staff can easily send out a text-blast to registered participants with information about the food and location after they complete ensuring food safety. A guideline similar to the Colorado State University Guideline for Food Recovery from 2019 (See Appendix G for link to the guidelines), could also be scaled up and applied to UBC Food Services catering to promote the recovery of food from catered events.

5.2.3 FOSTERING A RELATIONSHIP WITH THE UBC COMMUNITY FOOD HUB

Finally, we recommend that the UBC Food Recovery Pilot Program spend time nurturing a relationship with the UBC Community Food Hub. As the UBC Community Food Hub grows and solidifies itself, there may be potential for cross collaboration either through sharing volunteers, opportunities for student leadership, or more places for recovered food to reach the student population.

5.3 RECOMMENDATIONS FOR FUTURE RESEARCH

Moving forward, the switch to All Access Dining provides lots of potential avenues for future research. In a future LFS 450 course project, we encourage students to investigate funding opportunities to enhance the longevity of UBC's food recovery program. The funding for the pilot program would focus on ensuring a paid position that coordinates the food recovery process, such as a donation manager. We also encourage for a future group to identify new trends of food waste in this new model, as well as identifying

If given long term funding, it would be ideal if a donation manager could be hired through. The donation manager would oversee maintaining records of the donations, coordinating food security and food recovery initiatives on campus, and communicating between donors, such as UBC Food Services, and recipients, such as UBC Sprouts. During our primary and secondary research, it became evident that a recurring barrier in food recovery initiatives was the lack of sustained funding. Furthermore, relying solely on volunteers, especially at a post-secondary institution where much of the population leaves after a few years, is unsustainable because, with such a high turnover rate, it is difficult to see-through a project from ideation to action. By having a paid position, even when there is a switch over, the transition between coordinators would be smoother and the food recovery program would be less affected than a solely volunteer program. As mentioned in our discussions, an option to eliminate the challenges related to food donations logistics, staffing challenges, funding for staff, and improve the relationship between the donors and recipient organizations would be to create a position that will work within Open Kitchen and throughout the other UBC Food Services dining hall locations.

6. CONCLUSION

Throughout this project, we gained valuable insight into current best practices surrounding food recovery, as well as prominent challenges. In our secondary research, we sought to understand the organization of prominent food recovery programs at other post-secondary institutions in Canada and the U.S., while identifying what they are doing well, and what barriers they have had to overcome. Common barriers found in our research were lack of funding, difficulty sustaining initiatives, labour shortage and high volunteer turnover, food safety and liability on behalf of the donors, and transportation and storage logistics. We have made recommendations to mitigate these barriers and hope that they will sufficiently support the sustainability of this program at UBC. We believe the insights from this project can create and change the way UBC deals with surplus food on campus. With proper funding and resources to improve this program, this research can lead to a long-lasting implication and be a model for other institutions to follow. Finally, we want to thank the interviewees who shared their time and experiences, our partner and clients, our SEEDS representative, and our course instructor for supporting us through this opportunity to improve our campus food system.

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APPENDICES

APPENDIX A: INTERVIEW SCHEDUELES

Interviewee	Organization
Michelle Reining	Vancouver Food Runners
Alice Ma	Washington State University
Tonie Miyamoto	Colorado State University
Milton Calderon	Mealcare
Brain Bogart	Open Kitchen
Anne Ilustrisimo	University of California San Diego
Christine Halonen	UBC AMS Catering
Jessica Hernandez	UBC Seeder
David Speight and Darren Clay	UBC Food Services

APPENDIX B: RECRUITMENT STRATEGY

Outreach email to other campus food recovery programs

Hello,

I am a senior student at the University of British Columbia working with our Campus Food Services on a research project to evaluate and improve our Campus Food Recovery Strategy. I am reaching out to others involved in food recovery programs to learn more about their operations, successes, and challenges to influence our Campus Strategy. I would love to schedule a short zoom call or phone call to talk about your food recovery program and to share knowledge and information. Connecting with you would be invaluable to our project to help us in the creation of our Campus Food Recovery Strategy. We are

If this interests you, please email me back and we can set up a time at your convenience, sometime between now and Friday March 11th.

Best,
Lauren Ebert

Outreach Email to Representatives Affiliated With UBC

Subject: Call for Participation: UBC Food Services + SEEDS Campus Food Recovery Research

Hello <name>,

My name is Bryna, and my colleagues Lauren, Amalee, Crystal, and Kaori (cc'd) are undergraduate students in the Faculty of Land and Food Systems at UBC. We are working on a project with the SEEDS Sustainability Program and UBC Food Services entitled "Promoting Campus Food Security through Food Recovery: An Evaluation of the UBC Food Recovery Pilot Program". This project seeks to advance food recovery programs and help develop a Campus Food Recovery Guideline for UBC.

As a part of our research, we are hoping to interview individuals like you with invaluable knowledge, experience, and input related to food waste and diversion on campuses to better understand the successes and challenges of food recovery strategies.

We would like to schedule a 20-25 minute Zoom interview with you between February 28th and March 11th. *We have attached this* **Doodle Poll** *to input your potential availability.* ***Please let us know 2-3 time slots that work for you by next Thursday, February 24th.***

We also require you to e-sign and return the following consent form which is attached below.
Once we have received your potential availability and signed consent form we will send you a confirmation email along with the interview questions.

If you are unable to meet with us, we would appreciate any other recommendations or resources you have to offer. We would be happy to provide more information or answer any questions you have. Thank you for your time, we are looking forward to hearing back from you!

Best,
Bryna, Lauren, Amalee, Crystal, and Kaori.

APPENDIX C: INTERVIEW QUESTIONS

Moderator script

Hi _____, thank you so much for taking the time to meet with us today, my name is _____ and my pronouns are _____.

First, I would like to acknowledge that I am calling in from the traditional, ancestral, and unceded territory of the Musqueam people. I recognize the heterogeneity of Indigenous people on this land, and the importance of acknowledging them especially when doing work around food security, given that they have and continue to be incredible stewards and protectors of the land

The purpose of this interview is to understand the operations, successes, and challenges of successful campus food recovery programs. We plan to use the data from this interview to create guidelines for the UBC Campus Food Recovery Strategy. As a part of our final deliverables, we will be writing a report based on our findings that may involve using the data sourced from this interview.

We allotted 30 minutes for this interview but it likely will not take the whole session. We feel that we have a lot to learn from you, so the questions are going to be based on your program and experience, but please let us know if you wish to remain anonymous in our study.

Is it okay if we record/transcribe this session?

Before we dive right in, did you have any questions for us?

Interview questions for CSU, MealCare, Washington State University, and UCSD

- *Can you tell us a little about your role/organization?*
- *We see that (organization name) does (summary of what they do). Can you describe how the operation looks day to day?*
- *What are the things you do differently from other food recovery organizations?*
- *What are some of the challenges in your process?*
- *What technological innovations do you use in this operation?*
- *How do you keep track of the positive impacts you have made in the community?*
  - *Ie. Number of meals, kg of food donated, kg CO2e GHG emission reduced, monetary value of food recovered etc*
- *How has your program changed since it was first launched?*
- *Do you have any additional advice? What recommendations do you have for a pilot program that is starting to take off?*

Interview questions for UBC Food Services

- *In your opinion, what are the top 3 challenges or barriers to food recovery (or a food recovery program in general) at UBC Food Service locations?*
- *What are some considerations for (campus) food recovery that you think are often overlooked?*
- *Do you have any recommendations that you think should be implemented into this program?*
- *Are you interested in a partnership with Vancouver Food Runners (VFR) that would support UBC Sprouts?*
  - *Volunteer turnover rate will be less of an issue as many of these volunteers are retired/ families living in the area (not students)*
  - *This would keep the food within UBC campus --> We can have UBC Sprouts as the recipient and so all food recovered in this area (UBC Campus) would be directed there*
- *Would you be open to reducing the price/ discounting Grab & Go (prepackaged products) the day of the best before date? (ie. 25% price reduction sticker?)*
- *How do you think you can be better supported in the process of recovering food?*

Interview questions for UBC Open Kitchen and VFR

- *What was your experience participating in the pilot food recovery program like?*
- *In your opinion, what are the top 3 challenges or barriers to food recovery at UBC Food Service locations?*
- *What are some considerations for (campus) food recovery that you think are often overlooked?*
  - *Do you have any recommendations that you think should be implemented into this program?*
- *What food do you see is the most recovered?*
- *What foods are most wasted/ cannot be recovered?*
- *How do you think you can be better supported in the process of recovering food?*
- *Who else on campus do you think should be involved in engagement around food recovery?*

Interview Questions: UBC Sprouts and UBC Seeder
- *To start, can you walk us through your role in the food recovery pilot?*
- *What are some challenges that you have in recovering food?*

- *What are some improvements that you would implement?*
- *Do you find this food recovery program useful? How so?*
- *What are some things/resources you need support with your initiative?*
  - *What do you wish to see?*
- *Where would you like to see this project in 5 years?*
- *Which areas do you think have potential for expanding your initiative?*
- *Do you have any additional advice of what should be included as we endeavor to make food recovery guidelines for UBC Food Services?*

(UBC Seeder specific question):

- What is your driving route and how long does it take you to deliver the food?

APPENDIX D: PRIMARY INTERVIEW RESULTS

Raw Data from Interview Results: Frequency of Each Sub-Category by Interviewee

Interviewee Sub-Category	VFR	WSU	CS	Meal Care	UBC OK	AMS Catering	UBC Seeder	UBC FS	UCSD	UBC Sprouts	Total
Food Pickup Logistics	2	2	3	1	1	3	2	3	0	0	**17**
Transportation Logistics	3	0	0	0	0	1	3	2	2	0	**11**
Food Safety/Liability	2	3	3	1	0	2	0	0	0	0	**11**
Funding	2	0	1	0	0	3	0	2	1	1	**10**
Food Storage Logistics	0	5	0	1	0	1	0	1	1	1	**10**
Volunteer Yield	3	0	0	2	0	0	2	1	0	1	**9**
Campus food guidelines	1	1	3	1	0	0	0	0	0	0	**6**
Food Recovery Awareness	2	0	0	0	0	0	0	0	1	0	**3**
Food waste reporting	1	1	0	0	1	0	0	0	1	0	**4**

Example of food pickup communication via instant messaging platform
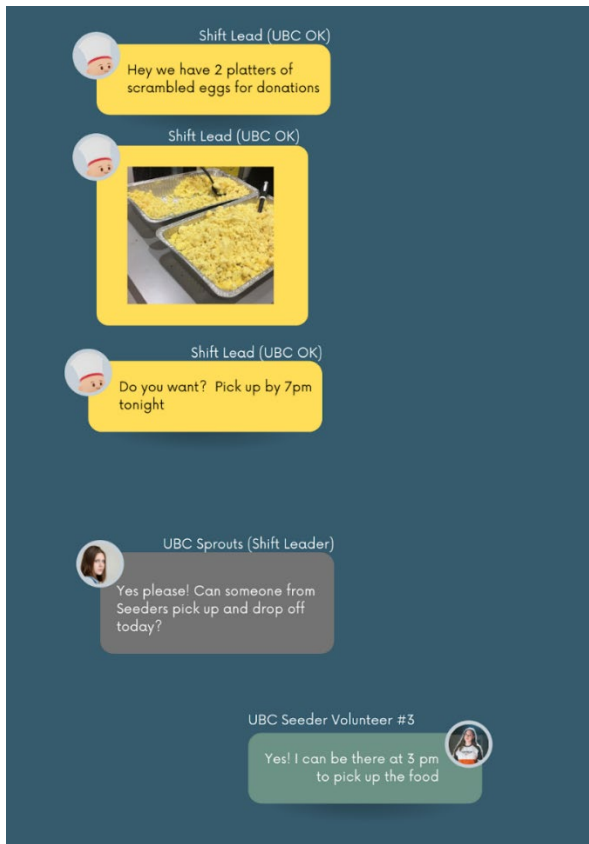
Visual of potential food recovery logistics organization

Potential food recovery program logistics organization
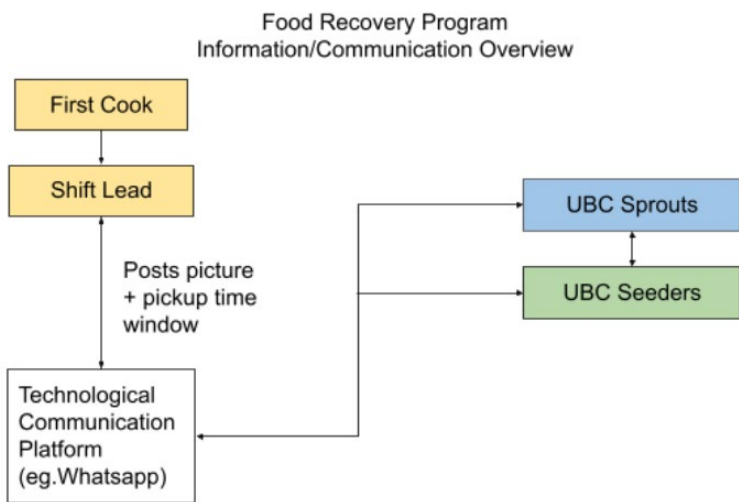
APPENDIX F: TEMPLATE OF FOOD WASTE TRACKING IN EXCEL

Example of an Excel Sheet document to track monthly food recovery progress (Excel file was submitted as a deliverable to UBC Food Services)

Colorado State University Guideline for Food Recovery, 2019
https://ramfoodrecovery.colostate.edu/wp-content/uploads/sites/11/2019/01/CSU-Food-Donation-Recovery-Guidelines-2019.pdf