UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Alma Mater Society (AMS) Food Recovery Strategy

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University of British Columbia

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EXECUTIVE SUMMARY

In Canada, it is estimated that 20% (11 million tonnes) of all the food produced annually becomes avoidable food waste, which entails that this food that could have been eaten, but was landfilled, burned or managed as compost (Climate Change Canada, 2019). Food waste is a key food issue the modern world faces today, and is highlighted as part of Goal 12, Responsible 443 Consumption and Production, in the United Nations' Sustainable Development Goals (SDG). Specifically, in SDG 12.3, indicating a target of cutting food waste in half per capita at consumer and retail levels, as well as decreasing food losses along supply chains (United Nations, n.d.). The International Water Management Institute (IWMI) quantified data which showed that the amount of food produced on farms is significantly greater than what is necessary for a healthy, productive, and active life for the global population (Lundqvist, de Franiture, & Molden, 2008). Despite the high quantity of food produced, food insecurity still exists and persists especially in lower income populations (Roshanafshar & Hawkins, 2015). Food insecurity is defined as having very limited access to a sufficient amount of affordable, nutritious food (Collins, Gaucher, Power, & Little, 2016). Currently at UBC, it has been found that almost 40% of the student population is food insecure (Nguyen, 2019). The purpose of our research was to address how the leftover edible food from AMS Conferences & Catering can be safely packaged and stored for those who attend the AMS Food Bank rather than going to waste.

This project aimed to tackle food waste and food insecurity on campus by assisting the Alma Mater Society (AMS) at UBC in providing recommendations for an appropriate Food Recovery Strategy to reduce food waste on campus and increase access to prepared foods for emergency food relief in the UBC community. The overall project goal was to inform AMS Conferences & Catering (C&C) and the AMS Food Bank of the logistical barriers/challenges in relation to repackaging, storage, and distribution of prepared, uneaten foods, and strategizing ways to overcome these barriers. More specifically, we worked with these organizations to provide recommendations on key areas of a standard operating procedure (SOP) strategy. We addressed our goal by identifying the barriers and risks associated with food recovery. This entailed background planning, identifying processes, project partners and stakeholders required to launch, maintain, and support this program, and identifying expenses (labor) and potential funding opportunities.

The proposed research was based on the Community-Based Action Research (CBAR) framework, by which we engaged in a collaborative process with our partners and involved stakeholders who are affected by the issues and research. This was done through acquiring primary data based on interviews with key stakeholders, including AMS C&C and the AMS Food Bank staff, analyzing waste logs of the kitchen used by AMS C&C to quantify the amount of edible and uneaten food wasted, and reviewing the infrastructure provided for the AMS Food Bank and AMS C&C. Secondary data was obtained through researching successful food recovery programs done by other organizations, obtaining data on the amounts of leftover food after events from AMS C&C, doing a literature review by obtaining and citing from scholarly articles, and reviewing food safety guidelines by Vancouver Coastal Health and the Greater Vancouver Food Bank.

Our research outcomes identify common barriers amongst AMS C&C and the AMS Food Bank with infrastructure, labor, consistency, and accountability. Therefore, we have made the following recommendations to further develop a food recovery strategy for AMS C&C and the AMS Food Bank. We recommended immediate action items as follows: establish communication between organizations, apply for our suggested funding opportunities, focus on ambient food recovery and to establish traceability for donated food products. Our long-term action items focus on implementing amendments to the Climate Action Plan and Zero Waste Action Plan, the formation of a food policy on campus, and the development of a prepared food standard operating procedure.

With regards to these recommendations, we have also identified potential research opportunities that can help create a food recovery strategy at UBC. Further research into policy identification and ambient food recovery, could lead to it being immediately adapted within the AMS Operations toward a prepared food recovery program. Through this project, the UBC community can come together to address the issues of food waste and food insecurity through systemic and sustainable change.

LIST OF FIGURES

LIST OF ABBREVIATIONS

AMS → Alma Mater Society

AMS C&C → AMS Conferences & Catering

BC CDC → BC Centre for Disease Control

CAP → Climate Action Plan

CBAR → Community Based Action Research

LFS → Land and Food Systems

NZWC → National Zero Waste Council

SDG → Sustainable Development Goal

SOP → Standard Operating Procedure

UBC → University of British Columbia

UBC FS → UBC Food Services

ZWAP → Zero Waste Action Plan

1. INTRODUCTION

1.1 RESEARCH TOPIC

The Alma Mater Society (AMS) is the student society of UBC's Vancouver campus. Their overall mission is "to improve the quality of the educational, social, and personal lives of the students of UBC." (AMS, 2019). To accomplish this mission, they provide a variety of services along with educational campaigns that aim to curb food waste. For example, AMS Conferences and Catering and Event Coordinators have reduced food waste in the last year by limiting over-ordering. This project expanded on their efforts by addressing food waste through food recovery, because there is still an opportunity to limit waste from leftover foods at catered events.

Food waste often gets mistaken for food loss. Food loss refers to the items that get damaged before being consumed at restaurants and retail stores, while food waste can be attributed to the food that is discarded or damaged at the latter (Climate Change Canada, 2019). Food that gets wasted can be recovered and donated to the local AMS Food Bank, if it is still edible and deemed safe to eat. The creation of a food recovery strategy and the collaboration of AMS Conferences and Catering and the AMS Food Bank will address these issues and make these operations more sustainable by connecting their inputs and outputs, in terms of food waste and food donations which can further advance these aforementioned societal issues.

1.2 RESEARCH RELEVANCE

Food waste is a multifaceted problem that impacts environmental, economic, and social capitals. In 2011, the Food and Agriculture Organization of the United Nations (FAO) reported that an estimated ⅓ of food is wasted globally each year (FAO et al., 2011). Within Canada, 40% of food that is produced gets wasted annually (Li & Soma, 2017). This results in decomposition of food waste materials if gone to the landfill, where the creation of greenhouse gases through anaerobic decomposition will contribute to climate change. Specifically, methane gas is created, which is 25 times more potent than CO2 gas (FAO, 2013). The United Nations (UN) has created the target of halving global food waste under the Responsible Consumption and Production Sustainable Development Goal (SDG). Thus, food waste is a worldwide issue that needs to be addressed. At UBC, food waste is a primary focus of the Point Grey Campus' Zero Waste Action Plan, especially food scrap separation from garbage (UBC Campus Community and Planning, 2014). Our project can address the target of diverting 80% of food waste, and it will reduce the amount of waste that is sent to the landfill. Although food can be composted, it may be beneficial to

have food recovery strategies in place because it addresses the tied social capital issue of food insecurity by relieving the edible food to those who are in need of it and it would reduce the amount of uneaten food sent to the landfill. A SDG from the UN that directly relates to our project, is the goal to achieve Zero Hunger. Global food insecurity is a worldwide problem that is damaging to society, it is also a local problem because five universities across Canada reported that food insecurity among students ranges from 29% to 46% (Silverthorn, 2016). It can be especially detrimental to academic communities like UBC because food insecurity has been shown to impact the physical, mental and social health of individuals, leading to further health problems (Tarasuk, et al., 2015) which in turn can affect the academic performance of these individuals (Jyoti, Frongillo, & Jones, 2005). The economic capital is impacted by the amount of embedded value that is gone to waste throughout the supply chain and the amount of money that is being spent on the food. Some of the campus' current strategies simply involve composting food scraps, which leaves room for improvement.

Our project addressed the aforementioned problems and its alignments with multiple Sustainable Development Goals and UBC's commitment to wellbeing, which is based off of the Okanagan Charter. The Okanagan Charter is an international charter that promotes health and provides institutions with principles and a framework to become a health and well-being promoting campus. The UBC Wellbeing program encompasses this charter by embedding health into all aspects of campus culture including the administration, operations and academic mandates. It has the potential to increase sustainability at UBC by reducing the waste within the UBC food system while simultaneously enhancing the food security for underprivileged individuals. With regards to overall sustainability, it can benefit the environment by diverting uneaten food from landfills to the AMS Food Bank. It also could improve the economic and social well-being of food insecure individuals by increasing access to food (via the AMS Food Bank), which would save their money and acknowledge their social well-being.

Our project can connect different campus groups and organizations together, which can create a more circular community. Entailing that the different group's inputs and outputs would complement each other and promote each other's operations. Overall, this can increase UBC's overall sustainability in terms of enhancing the environmental, social and economic aspects of this community.

1.3 PROJECT CONTEXT

The AMS Food Bank is an emergency food relief service for UBC students, allowing 8 visits per person/ family per semester. As the clientele is increasing, there is a need for more prepared foods. The Food Bank and UBC Food Services have worked in the past on a food recovery initiative (Lu et al., 2017), but the Food Bank wanted to seek out additional opportunities to develop a food recovery program.

AMS Conferences & Catering previously attempted to reduce the amount of uneaten food left over from catered events by suggesting that clients only order enough food for all their guests. However, there is still food that is uneaten and left in the kitchens which could be repurposed. Therefore, there appears to be a strong potential for these two organizations to collaborate.

There is little in the literature examining food recovery of the service sector (e.g. catered events and banquets) specifically. Instead, food recovery literature typically involves distribution optimization, in which a Food Bank or related organization comes with a vehicle at a given time to collect near-expired or unwanted food products from a grocer or wholesaler (Sewald et al., 2018); (Reynolds et al., 2015); (Phillips et al., 2013). One success story of food recovery from the service sector is that of the partnership between Three Square Food Bank and MGM Resorts International in Nevada. The two developed a standardized program in 2016 which covered collection, preservation, and distribution of uneaten foods at banquets (Three Square, n.d.). Although MGM had significant monetary resources, which is what allowed this initiative to be successful, the creation of a standard operating procedure is something that could be applied for AMS operations. This collaboration has also been cited as a model that other food rescue initiatives should follow (To et al., 2019).

Food recovery assessments in scientific literature (i.e. peer-reviewed journals) often list temperature control, adequate storage, and efficient distribution as critical components of successful food recovery regardless of where the food is coming from (Sewald et al., 2018); (Reynolds et al., 2015); (Phillips et al., 2013); (Schupp et al., 2018); (Nair et al., 2018); (Lu et al., 2017); (Rey et al., 2018). Other important components include labor (volunteers or staff), funding, infrastructure, and strong relationships between partners (Lindberg, 2014); (Hecht & Neft, 2019). Furthermore, multiple studies note that further research and evaluations are required to fully review

the extent to which food rescue initiatives can be successful (Hecht & Neft, 2019); (Reynolds et al., 2015); (Watson, 2019).

In addition to the Three Square/MGM program, a starting point for this project was reviewing the Industry Food Donations guideline developed by the Greater Vancouver Food Bank and the BC Centre for Disease Control. Within the guideline, there is a section on catering and restaurant donations which is integral in ensuring health standards are met (BC Centre for Disease Control et al., 2015).

1.4 PROJECT PURPOSE, GOALS AND OBJECTIVES

PROJECT PURPOSE

The intention of this research is to assist AMS Operations in developing a food recovery strategy to reduce food waste on campus and increase access to prepared foods for emergency food relief in the UBC community.

PROJECT GOAL

Inform AMS Conferences & Catering (C&C) and the AMS Food Bank about the scope of key logistical barriers/challenges regarding the repackaging, storage, and distribution of uneaten foods, and propose ways of overcoming those barriers.

PROJECT OBJECTIVES

- Identify risks associated with food recovery and plan around these risks
- Identify processes required for this initiative
- Identify project partners and stakeholders required to launch, maintain, and support this program
- Identify expenses (labor) and potential funding opportunities

2. METHODOLOGY AND METHODS

2.1 RESEARCH METHODOLOGY

The research of our project was conducted using the Community Based Action Research (CBAR) framework. It primarily relied on a partnership based approach for our research and the development of data. The continuous help from key stakeholders in the AMS Food Bank and AMS C&C contributed significantly with our primary- (e.g. in-person interviews) and secondary data (e.g. waste logs), as well as auditing said data. We

recognize that we as LFS 450 students are not experts in the food service industry, so it was crucial to utilize the knowledge from our clients who have information regarding that sector.

More specifically, we relied on the information from the management techniques practiced by our clients, which focused our research direction and methods. We also wanted to ensure that the food recovery strategy recommendations met the goals of both AMS C&C and the AMS Food Bank. Although there are food recovery programs that exist today in which we could have directly referenced, using the feedback from our clients at each project cycle allowed us to adapt strategy recommendations that catered to both organizations' specific needs and preferences. With regards to that, we did not find a specific strategy that had a documented operating procedure that dealt with organizations within other universities.

2.2 RESEARCH METHODS

To obtain our primary data, we conducted in-person semi-structured interviews, had meetings every three weeks with our project partners, and sought out observations. To collect our secondary data, it consisted of us finding research through our literature reviews by reviewing scholarly journals on topics related to food recovery, food waste, or food insecurity. Furthermore, we were able to look over a waste audit for AMS C&C, as well as look over AMS C&C's menu to use as a reference for the various types of food that can be recovered.

2.2.1 SECONDARY DATA COLLECTION RESEARCH METHODS

We each conducted an online literature review using Google Scholar, UBC Library Catalogue (ie. Summons), open access articles, and databases on topics related to food recovery, food waste, or food insecurity. This was done to help identify policies that relate to food recovery (or food waste), what organizations employ food recovery, challenges/barriers to food recovery, gaps in knowledge surrounding food recovery, understanding food insecurity amongst college students, and references for developing a waiver form. To select our found articles, we searched for keywords "food recovery", "food insecurity amongst college students", "Food Banks", "food insecurity policies", "food waste policies", "food rescue" + "barriers", "food rescue" + "policies", "food recovery" + "guidelines", and "food recovery" + "procedures". In addition to scientific literature, we reviewed reports/plans/guidelines of organizations who facilitated and employed food recovery to identify good practices to adapt for our food recovery strategy.

We were also given a catered event waste log (Appendix 1) by Christine, to identify which foods are wasted the most and see how often events were being held. Moreover, we used AMS C&C's menu as a reference to determine which foods could be recovered.

To find potential funding opportunities as per our third objective, we searched online for funds or grants available in Vancouver and if there were any for universities. We also searched specifically non-profit organizations by which the AMS Food Bank would be able to apply for.

2.2.2 PRIMARY DATA COLLECTION RESEARCH METHODS

In order for us to obtain primary data, we conducted in-person semi-structured interviews, meetings, and sought out observations. We decided to conduct our interviews and meetings with those who had a senior position and/or oversaw their organization's operations. Our stakeholder meetings were every three weeks with Cali Schnarr, the AMS Food Bank Coordinator, Christine Halonen, AMS C&C's Senior Manager, Sophorn Kong, AMS C&C's Operation Manager (who came in place of Christine due to schedule conflicts), Ernielly Leo, our SEEDS representative, and David Gill, our former SEEDS representative (on February 10th, SEEDS project management for our project was passed onto Ernielly Leo). These meetings were done in accordance to our agendas in Appendix 2 and were done to update our project partners on our ongoing research and collaborate on steps moving forward with action items.

Our interviews were done individually with Vishwa Mohan, AMS C&C's Chef de Cuisine and Sophorn, who we both contacted through Christine. Initially, we had intended to speak with more AMS C&C staff, however, Christine directed us to Vishwa and Sophorn as she thought they would be a better resource as they oversee the staff (ie. kitchen and operations) and were able to answer our questions on workflow, storage, and resources. Our interview with Sophorn was done in conjunction with our observations while touring the AMS C&C facilities to give us an insight into the kind of infrastructure that is present. We were also able to observe the AMS Food Bank with Cali to see the extent of their storage capacity, what foods they currently offer and at what quantities, and what infrastructure and space they have in place to hold the recovered food.

Our first meeting outside of our project partners was conducted with UBC Food Services' (UBC FS) Executive Chef, David Speight. We met with David as he currently oversees UBC FS's food recovery program and

based it off our meeting agenda shown in Appendix 3. Our meeting objectives were to: review the status of the previous food recovery plan (i.e. is it still being used?); discuss challenges/successes of the UBC FS + AMS Food Bank collaboration; outline infrastructure required for the previous project; review labor cost of previous project; and inquire about potential references.

Our interview and meeting protocols followed TCPS 2 ethical guidelines and considerations. Additionally, we abided by the guidelines developed from the SEEDS initiative.

2.3 METHODS OF ADMINISTRATION

For our primary data, we initiated contact with our interviewees, Vishwa and Sophorn, through our project partner, Christine. As our interview questions (Appendix 4 & 5) were context specific to AMS C&C, we interviewed Vishwa and Sophorn to attain a better understanding of AMS C&C's operations. We were introduced to them both via email through Christine and concluded our interviews at a later date. Our data collection for both interviews was taken by written notes, which were then transcribed onto Google Documents. Both interviews were located at AMS C&C to coincide with a site tour.

Our meeting with David Speight was organized through our previous SEEDS representative, David Gill. Our stakeholder meetings were held every three weeks, shown in Appendix 6 with our dates and who was present.

We decided to do all of our data collection in person as it would help our interviews and meetings with any clarification, as well as conducting our observations in person to ask any questions while viewing facilities.

3. RESULTS

3.1 SECONDARY DATA RESULTS

Much of the secondary data gathered revolved around the barriers to food recovery programs, which encompasses the first two objectives of our project, and identifying potential funding opportunities as per the third objective of our project. One challenge faced is that there is a gap of knowledge in scientific literature regarding the recovery of prepared/hot foods. In general, the key barriers to food recovery were examined and those that pertained to hot food were selected for this project. Good practices used by organizations that employ food recovery were also examined.

3.1.1 POTENTIAL FUNDING OPPORTUNITIES

To address our third objective of identifying potential funding opportunities, our team has researched the organization, grants or funds, eligibility, and amount in the table below that give the possibility of covering expenses.

Table 1

Potential Funding Opportunities

Fund	About	AMS Operations Eligibility		More Information
AMS Sustainability Projects Fund (SPF)	The AMS SPF was developed in September 2011when a referendum was passed by UBC students to support student-led sustainability projects ("Sustainability Projects Fund | AMS of UBC", 2019).	The SPF encourages UBC students to apply with their projects that advance ecological, economic, and social sustainability on campus. The primary applicant for this fund must be a UBC student, so it is possible if the project is able to continue as another LFS 450 and/or SEEDS project.	*Small Project:* Up to $1,000 *Large Project:* Up to $15,000	Sustainability Projects Fund
Local Food Infrastructure Fund: Infrastructure and Equipment Improvement Projects	This program is offered by the Government of Canada and aims to increase access for food insecure populations and strengthen food systems. This stream, 'Infrastructure and Equipment Improvement' aims to help organizations improve their infrastructure and access to purchasing equipment ("Local Food Infrastructure Fund - Infrastructure and Equipment Improvement Projects - Agriculture and Agri-Food Canada (AAFC)", 2020).	Charitable organization, which the AMS Food Bank falls under and is recognized as, and have been in operation for at least two years.	$5000-$20,000	Local Food Infrastructure Fund (link is external)
Green Grant	The Green Grant is supported by the City of Vancouver to help achieve Vancouver's Greenest city goals (City of Vancouver, 2020).	There was not detailed eligibility, it included: being located in and benefits Vancouver and being 1 to 3 years in duration.	Up to 50% of the project's budget (maximum of $100,000)	https://vancouver.ca/people-programs/green-grants.aspx?fbclid=IwAR29wRe8Q4sA7rRwtgXlZH_gGNKlM8GPsi_frG4I

				NTmjP3B5eFsOGyNTx7I

3.1.2 KEY BARRIERS

In the literature review, which was further explained in the methods section, three key barriers were identified: a lack of food recovery in government policy at all levels (i.e. federal, provincial, municipal), real or perceived risks (i.e. food safety), and real or perceived costs (i.e. infrastructure, labor, and time). While other barriers may exist, these do not relate to prepared/hot food recovery and will not be mentioned in this report.

LACK OF POLICY

Food recovery policy has been identified as a necessity to support food recovery strategies (Bierma et al. 2019; Hecht & Neft 2019; Thyberg & Tonjes 2016, Uzea et al. 2014; Van Bemmel 2016). However, they are normally developed by non-profit organizations who may not have direct support from the government (Baglioni et al. 2017).

At the national level, Canada's National Food Policy addresses food insecurity and poverty (Agriculture and Agri-Food Canada 2019), but does not include food recovery language as a proposed method of overcoming these social issues. The language used within the policy is relatively vague in that, although food waste reduction is one of the priorities within the current policy (Agriculture and Agri-Food Canada 2019), the actual methods of how are not provided.

At the provincial level, Ontario is the only province that includes food recovery in policy. The "Resource Recovery and Circular Economy Act, 2016" allows the government to implement policies regarding food recovery and requires various organizations to comply with these policies (Government of Ontario, n.d.). Specifically, this allows the Ontario provincial government to employ the "Food and Organic Waste Framework: Action Plan", which will develop food safety guidelines regarding donated food, support food recovery research, support food recovery infrastructure, update the 3Rs (reduce, reuse, recycle) regulations to include food waste, and introduce food recovery activities to schools (Government of Ontario, 2017). Other provincial governments have done studies on food waste (IMC, 2017) or may suggest food waste on their websites (Government of British Columbia n.d.), but do not actually have a policy in place.

At the local/municipal level, Vancouver's Food Strategy includes a food recovery 'pilot program' as an action area for the future, but does not expand upon this further and primarily focuses on food waste reduction and diversion from landfills to compost (City of Vancouver 2013). Included within the local level are universities such as UBC and their policies/plans. The most pertinent plans at UBC are the Zero Waste Action Plan (ZWAP) and the Climate Action Plan (CAP), since they include some element of waste reduction. However, neither of these plans include food recovery language except for a brief mention in the ZWAP within the background information section (UBC Campus and Community Planning 2014).

REAL OR PERCEIVED RISK

Real or perceived risk was a relatively large barrier within the literature (Bierma et al. 2019; Bilska et al. 2016; National Zero Waste Council 2018; Nikkel et al. 2019; Uzea et al. 2014), typically due to concerns of liability from potentially negative health effects if the food is not handled properly or becomes otherwise inedible.

There are easily accessible food donation guidelines available online by non-profit groups such as the National Zero Waste Council (NZWC) and by provincial authorities such as the BC Centre for Disease Control (BC CDC) that highlight the processes required to donate various types of food. There are also provincial laws protecting food donors and distributors of any damages incurred from consuming donated food unless it was deemed 'unfit' (i.e. rotting, damaged, etc.), but this requires that the food was handled safely (National Zero Waste Council 2018). The perception is that there is no protection against liability, but the real risk is incurred if proper safety measures are not taken.

In British Columbia, all food businesses are required to have food-safe certification under the BC Public Health Act (Canadian Institute of Food Safety n.d.), but food banks do not fall under this act as food safety certification is not a requirement to volunteer at local food banks (Greater Vancouver Food Bank n.d.). Volunteers are the backbone of many food donor organizations (Tarasuk et al. 2014), but they may not know the specifics of recovering hot food (i.e. temperature, time to cool, reheating specifics) which could lead to unsafe handling (Schonberger et al. 2018).

REAL OR PERCEIVED COST

Costs were the largest barrier which includes infrastructure costs (i.e. storage units, adequate facilities for preparation, etc.), labor costs, transportation costs, and time costs to package or collect food for storage (National Zero Waste Council 2018; Reynolds et al. 2015; Uzea et al. 2014; Van Bemmel 2016). An additional point is that it is economically cheaper to prevent food waste from higher up supply chains (Thyberg & Tonjes 2015).

The different costs mentioned above can often be connected to each other. For example, time costs are related to both infrastructure (i.e. having the equipment to quickly cool food so that it can be stored safely) and transportation (i.e. efficient delivery routes), so finding ways to overcome infrastructure and transportation costs can reduce the time cost of recovering food.

Organizations such as Food Runners are present to limit the transportation cost of food recovery, whereas organizations such as Second Harvest are able to streamline the donation process through their online food rescue program and review recipient organizations for proper food safety (Second Harvest, n.d.). The perceived costs, such as transportation, can often be limited or somewhat negated if proper infrastructure and staff are present or a third-party organization is able to facilitate food donation, but recovery can still be costly overall for donor and recipient organizations/companies if they do not have the staff or infrastructure required. It can also take time to train staff to adapt organizational procedures/processes even if staff and infrastructure are present. It can also be costly if food donations are inconsistent since it reduces the efficiency and contributes to time costs. From the waste log (Appendix 1), consistency of events is a concern, and this will be addressed in the primary data.

GOOD PRACTICES IDENTIFIED

While national, provincial, and local governments do not provide recommendations for food donation, various organizations such as the BC CDC, NZWC, and Vancouver Food Bank offer food donation guidelines that are available online for the general public. Food safety certification is considered a priority and must at least be held by someone overseeing the donation process (Schonenberg et al. 2018). Traceability of the donated food is another point of emphasis and can be addressed with a waiver form or receipt (BC Centre for Disease Control et al. 2015; Lu et al. 2017; Three Square n.d.), which will be discussed later in the discussion and recommendations sections. Standard operating procedures are used by Three Square and MGM to maximize the efficiency of the program (Three Square n.d.) and may help reduce time costs.

3.2 PRIMARY DATA RESULTS

EVENTS INFORMATION

Event bookings occur throughout the year and range from small student meetings to large commercial conferences. Multi-day commercial bookings were identified as having the best potential for food recovery (S. Kong, personal communication, March 6, 2020) and typically occur between April-August, as students have priority during fall and winter semesters (i.e. September through April). Staff numbers will vary depending on the size of the event but are typically composed of university students, with the exception of the event leads. Refrigerators are present but are often full.

AMS C&C CURRENT PROCEDURES AND BARRIER IDENTIFICATION

The key points transcribed from our primary data collection (i.e. interviews/observations) were used to determine the current processes/operations of both the AMS Food Bank and AMS C&C.

The current C&C procedure is as follows:

1. Staff bring food from the kitchen (first floor) to the servery (second floor) in a hot box and portion it out based on the number of people and the serving style (i.e. 2-line buffet vs 1-line buffet)
2. Uneaten food is stored in large ovens in the servery (or in the hot box) and kept at 160ºF
3. Food is available to guests/clients for two hours, after which it is no longer considered food safe and is typically disposed of or composted
4. Uneaten food in the servery is brought back to the kitchen in a hot box and either:
    a. Composted
    b. Eaten by staff (food cannot be taken home)
    c. Saved for potential re-purposing
5. Ambient food (i.e. food that does not need to be refrigerated for storage) is placed on a shelf and labelled, cold food is placed into a walk in fridge for storage
6. Hot food needs to be cooled to 70ºF in ice baths before it can be put in the fridge
    a. Must reach 70ºF within 2 hours or it has to be composted
    b. If food reaches 70ºF, it needs to reach 40ºF in the fridge within 4 hours

From these steps we developed a flowchart (Figure 1) to identify the barriers that would require changes to this procedure. Temperature checks are done throughout the process to ensure that the food is maintained at the required food safe temperature (i.e., 160ºF) . It takes roughly three months to train service staff to be able to accomplish all their tasks without requiring constant supervision according to Operations Manager, Sophorn Kong (personal communication, March 6, 2020).

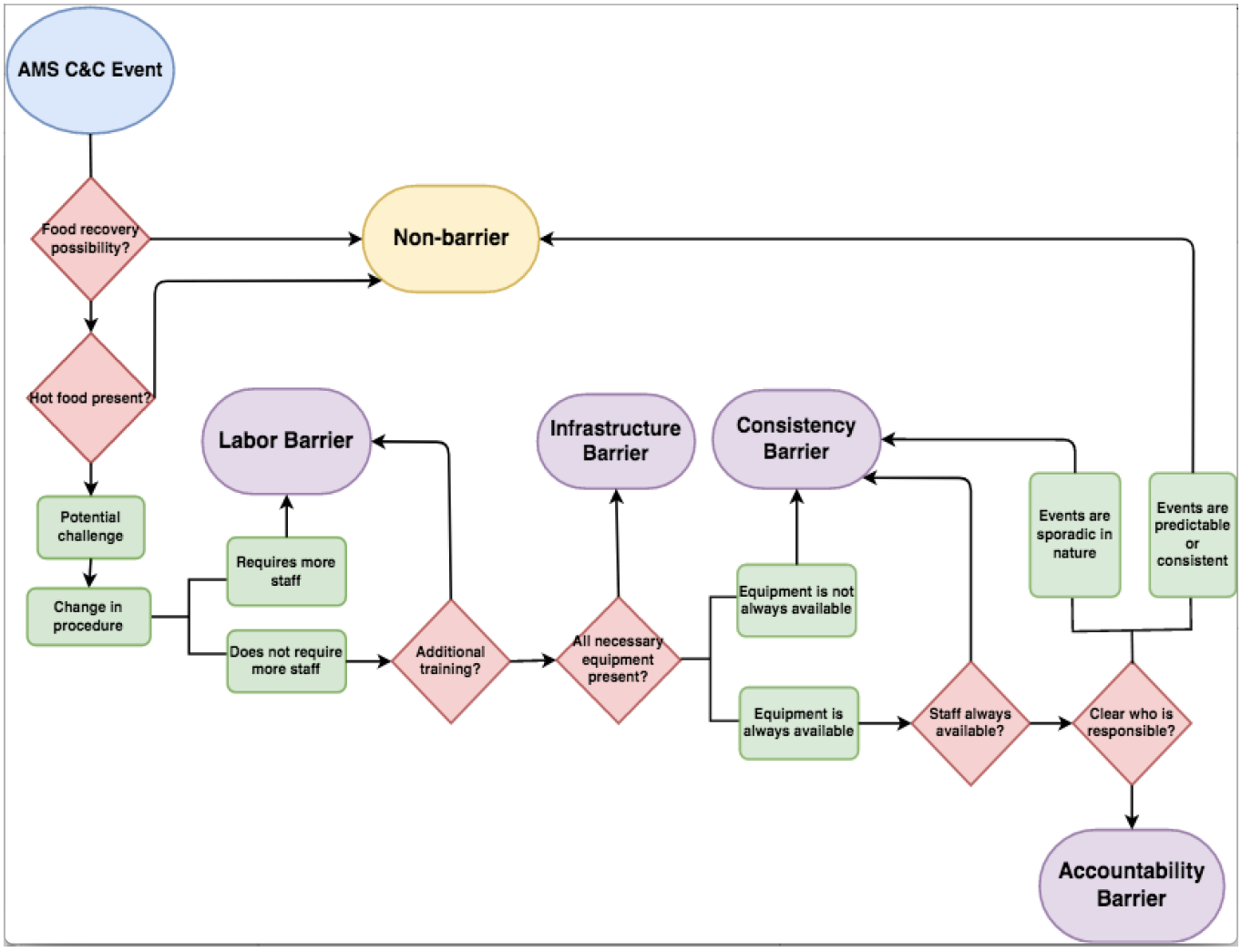
Food recovery would take place with the uneaten food left in the servery as food that has been out on the floor cannot be safely re-purposed. According to Chef de Cuisine Vishwa Mohan, food recovery would likely take approximately sixty to ninety minutes assuming a blast chiller is available, although it could take significantly longer without a blast chiller (personal communication, March 6, 2020). While steps are taken to reduce the amount of uneaten food (i.e. clients are advised not to over-order, logs are kept internally to see how much food is left over from events to propose food quantities for future bookings, etc.) there is still inevitable uneaten food. We identified four key barriers for C&C which are labor, infrastructure, consistency, and accountability. The barrier identification process was as follows:

1. Determine whether the event has enough left over food, specifically hot food as it is the desired product for the Food Bank
2. If food recovery is to take place, this could present a challenge that would require a change in procedure
3. If more staff are required than are present at the event (or that are currently employed) → **Labor Barrier**
4. If more training is required for staff to recover the food → **Labor Barrier**
5. If necessary equipment/facilities for food recovery (i.e. blast chiller, fridges, freezers) are not present → **Infrastructure Barrier**
6. If infrastructure is present but not always available → **Consistency Barrier**
7. If enough trained staff are present during the event but are not available at the time of food recovery → **Consistency Barrier**
8. If catered events are sporadic in nature (i.e. recovered food is not always available) → **Consistency Barrier**
9. If it is unclear who is in charge of each task → **Accountability Barrier**

Event leads (service staff) and kitchen staff are food safe certified and would likely be the most suitable to perform or oversee food recovery. Service staff would likely not be available after the catered portion is complete as they need to assist with tear down (i.e. taking down tables) but some could potentially bring the food to the kitchen to be recovered. In terms of accountability, from our interviews, it is still unclear how the task of food recovery would be divided. In terms of infrastructure, there is limited cold storage available and a blast chiller would likely be required to cool recovered food down quickly. The consistency of catered events also varies throughout the year. One interesting finding from our interviews was that both Sophorn and Vishwa noted that recovery of ambient food would likely be more feasible since it does not require temperature controlled storage (personal communication, March 6, 2020).

Figure 1

AMS C&C Flow Chart



AMS FOOD BANK CURRENT PROCEDURES AND BARRIER IDENTIFICATION

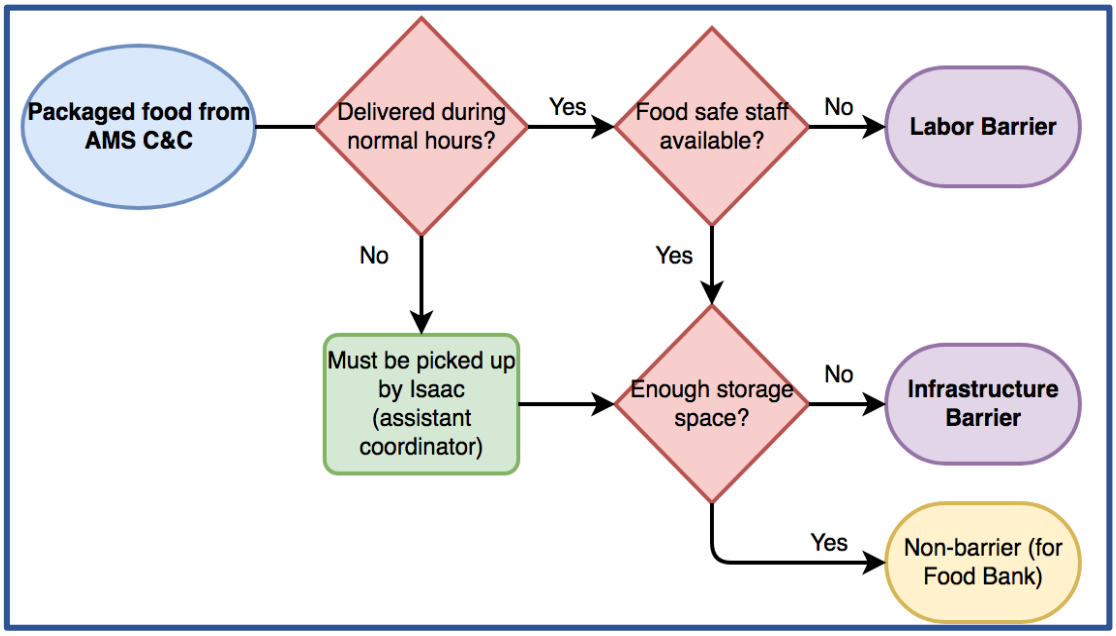
Food bank procedures are more simple than that of AMS C&C. Donations can be dropped off directly to the Food Bank during normal operating hours, or food can be picked up by the assistant coordinator (Cali Schnarr, personal communication, March 4, 2016). Food/supplies are placed on shelves or fridges within the Food Bank, which is set up like a grocery store, or may be placed in the storage room a few doors away (Cali Schnarr, personal

communication, March 4, 2016). Currently, the Food Bank primarily accepts non-perishable foods, but are always in need of frozen prepared meals (i.e. microwave dinners, pizza, etc.) and milk (Cali Schnarr, personal communication, March 4, 2016). The Food Bank currently does not have adequate facilities to package food themselves, so recovered food would need to be packaged by AMS C&C. For the Food Bank, we identified labor and infrastructure as barriers. Our identification process was as follows:

1. Packaged food is transported to the Food Bank
    a. If it can be delivered or picked up during normal hours, food safe staff need to be available to handle it
    b. If it cannot be delivered during normal hours, the assistant coordinator needs to pick it up
2. If food safe certified staff are not available → **Labor Barrier**
3. If there is not enough space in the Food Bank fridge or storage freezer → **Infrastructure Barrier**

Figure 2

AMS Food Bank Flow Chart



4. DISCUSSION

To summarize what was previously discussed, the primary purpose of our data collection was to identify the barriers to food recovery and use identified good practices to generate our recommendations. The common

barriers we identified from our primary data were infrastructure, consistency, accountability, and labor. The barriers identified from secondary data were lack of policy, real/perceived food safety risks, and real/perceived costs. These barriers are related to each other to varying degrees, but are all important to consider in food recovery. Our results imply that there is a feasible opportunity to create a food recovery program but there are further implications behind the barriers that may be difficult to overcome.

An overarching concern was the sporadic nature of events which we placed within the consistency barrier. As mentioned in the results, the inconsistent donation of food may reduce efficiency and increase time costs because the recipient organization (AMS Food Bank) has to make additional time to coordinate an appropriate delivery/pickup time and ensure there is enough storage available to receive the recovered food. Therefore, consistency is indirectly related to time costs as described in the results section. We set out to address the consistency barrier first because most successful food recovery programs all have ways to address consistency, whether it be in transportation of the food or the frequency of donations to the recipient organization. Although more associated with costs, non-profit organizations like Food Runners and Second Harvest also look to address consistency by connecting donor and recipient organizations. We used this basis to develop one of our recommendations which will be discussed later. Another point of emphasis was the need to develop a SOP. Christine had proposed a SOP from the beginning (personal communication, January 22, 2020) and our literature review confirmed that SOPs are part of effective food recovery programs. Other consistency concerns are related to the availability of infrastructure and labor.

Infrastructure was identified as the largest barrier for both AMS C&C and the AMS Food Bank. For C&C, an outstanding concern is the need to cool food down quickly to limit time costs and address potential food safety risks. A blast chiller was identified as the piece of equipment required to do this by Chef Vishwa (personal communication, March 6, 2020), but there are significant monetary costs associated with obtaining and running one. The AMS Nest currently possesses a blast chiller, which would solve the infrastructural barrier (Figure 1) , but the blast chiller is not installed. According to Chef Vishwa, a blast chiller requires more electrical energy than what is currently possible at the Nest, which is UBC's student union building and where AMS C&C caters to events. Upgrading the electrical infrastructure to accommodate the blast chiller would cost somewhere in the millions of dollars (personal communication, March 6, 2020). From our site tour, we also noted limited temperature controlled

storage space (i.e. fridges and freezers) to keep recovered food in prior to delivery/pickup. The available fridge space was also inconsistent in terms of availability (i.e. food for future events may be stored taking up space). The AMS Food Bank's infrastructure barrier is attributed to the amount of storage space they have, but this will likely only be a concern after the spring term at UBC has finished because of excess food donations from students moving out of residences (Cali Schnarr, personal communication, March 4, 2020). This barrier entails that they would get frequent donations from C&C. Which is not likely because the catered events can be sporadic, infrequent or frequent depending on the time of year. Additionally, the lack of food preparation facilities at the AMS Food Bank limits the flexibility of the program because C&C is required to package the recovered food into small individual or two-serving containers instead of providing a tray of recovered food. If large trays of food were recovered, the time cost on C&C's side would be reduced (David Speight, personal communication, February 6, 2020). However, this would increase the time cost for the AMS Food Bank and could impose potential food safety risks since not all Food Bank staff are food safe certified so the procedure outlined in the results section is likely the best unless funding, training, and facility upgrades were available to the AMS Food Bank.

Since we established that C&C staff would need to package food for the program, the next barrier involves accountability. It should be noted that, although directly associated with the labor barrier, accountability would still be a concern even if sufficient numbers of staff or training of staff is done because the allocation of tasks must be specific. As mentioned previously, during our site tour and interviews of C&C, our clients were uncertain over who would be responsible for the tasks of food recovery. Because kitchen staff and event leads are food safe certified, food recovery tasks would likely be assigned to them or at least closely monitored by them to ensure food safety is upheld throughout the process. Accountability is something that we were unable to fully address because it depends on who C&C believes is best suited for the job. Therefore we have not included action items within our recommendations for this particular barrier. However, it is likely that some combination of service and kitchen staff will be required. Service staff could bring uneaten food from the servery down to the kitchen, and kitchen staff could cool it down, package it into containers, and refrigerate/freeze it for storage until an appropriate delivery/pickup day is established.

From our observations, the labor barrier is not necessarily that there are not enough staff, but that staff in both organizations would require additional training in some capacity. The frequency of recoverable food based on

the waste log (Appendix 1) is likely insufficient to warrant hiring additional staff to recover, so we did not touch on this in our recommendations. Since not all Food Bank staff are food safe certified, the handling of recovered food would either need to be done by the coordinator/assistant coordinator (i.e. Cali and Isaac) or closely monitored by them. As mentioned previously, Chef Vishwa mentioned that training would not be a major concern on his side (personal communication, March 6, 2020), so labor may not be a significant barrier for AMS C&C. Once a standard operating procedure is put in place and accountability and infrastructure are accounted for, it should theoretically be simple to train C&C staff to package and store recovered food. The relationship between labor and costs is the time cost of training C&C staff and implementing new procedures for both the AMS Food Bank and AMS C&C.

Food safety will be touched on quickly as we determined that it would not be a major concern so long as the labor (i.e. training) barrier is accounted for. This is mainly attributed to the provincial laws in Canada that protect food donor and distributor organizations from being liable for negative health effects of consuming recovered food as long as proper food safety is maintained while the item was with the organizations (i.e. at the Food Bank or in the Nest kitchen). Traceability is suggested by the BC CDC's food donation document and can further address food safety concerns. Traceability involves a packaging date and some sort of label indicating where the food came from, but could also include ingredient lists and allergy warnings (BC Centre for Disease Control et al. 2015). On the other side, if AMS C&C wants to ensure they are not liable for damaged, a waiver form could be created transferring liability from the donor (i.e. C&C) to the distributor (i.e. AMS Food Bank) assuming C&C is able to maintain food safety throughout the recovery process (David Speight, personal communication, February 6, 2020; Lu et al. 2017; Three Square n.d.)

A final theme we want to discuss is policy. We have already highlighted the lack of policy at all levels of government and at UBC, but feel that it is worth addressing why it is important in more detail. As touched upon in the results, many food recovery policies are developed by non-profit organizations. However, without support from government or private companies, it can be challenging for non-profits to gain enough support or funding to enact these policies (Baglioni et al., 2017). Policies are an enabling feature as seen in Ontario with the "Resource Recovery and Circular Economy Act, 2016". Ontario's food recovery policies address two of our identified barriers in that it aims to develop food safety guidelines regarding donated food and will support food recovery research

and infrastructure. Policies also provide written support for food recovery and allow groups with authority to dictate the way we manage issues like food waste and food insecurity. While it is encouraging to see that policies like Canada's National Food Policy and plans like Vancouver's Food Strategy or Greenest City Action Plan address food waste prevention, there is still an issue of what to do with any food waste that cannot be prevented besides simply composting it. UBC is currently in the same situation because, as stated earlier, there is no mention of food recovery in its action plans or policies as of the writing of this report. It is clearly integral for policies that include food recovery language to generate meaningful and managed change, so policy development accounts for a large proportion of our recommendations.

LIMITATIONS

The limitations to our data can be attributed to the lack of interviews conducted. For example, more interviews within the AMS C&C staff may have provided additional insight toward the feasibility of our project. As mentioned previously, this was not valued as a significant source of information because performing interviews with part-time staff would be unreasonable because the staff are busy with events, which are often busy. Time constraints and the novel Covid-19 pandemic altered the agenda of many individuals, which also hindered our ability to perform additional interviews and onsite meetings. However, the information we gathered came directly from the individuals who make executive decisions and manage day-to-day operations. Therefore, we were able to gather all of the relevant information that enables us to make feasible recommendations in the next section. A limitation in secondary data was that there is a lack of scientific literature that specifically pertains to hot or prepared foods, so there could be other key barriers that we did not touch on.

5. RECOMMENDATIONS

5.1 RECOMMENDATIONS FOR ACTION

In summary of our findings, we have identified four key areas that require attention:

1. Consistency

2. Legal implications / food safety
3. Costs
4. Traceability.

As mentioned in previous sections, consistency is vital to a successful food recovery program. We identified this as a barrier due to the aforementioned problems associated with the sporadic nature of catered events. To overcome this, we recommend that a standard operating procedure and the development of a formal line of communication between AMS Conferences and Catering and the AMS Food Bank are critical, and provide logistical smoothness for the food recovery program. A standard operating procedure would entail the methods that pertain to food recovery within the AMS operations.

Legal implications refer to food safety and the protection of the consumer and organization (AMS C&C and the AMS Food Bank). We have developed a waiver form, shown in Appendix 7, which includes liability based on the BC Food Donor Encouragement Act (1997) that further protects the program from any ramifications associated with the recovered food product. Additionally, the food safety aspect should not be a concern as long as food safe certified staff are monitoring the program and are present during the food recovery process.

Financial costs are likely the most difficult barrier to overcome because the investment behind installing the available blast chiller in any of the kitchens within the Nest, may not be in the AMS' operational budget. There would also have to be additional budgeting for any staff changes or additional training that may occur from implementing the strategy. We have addressed this by including potential funding opportunities in our report (Table 1).

Lastly, we identified traceability as another key action area. Traceability refers to the information available to the consumer from the product itself, as the level of information provided can help further limit food safety risks and is recommended by the BC CDC. This would involve the inclusion of label, date of package, ingredients, basic nutritional information and potential preparation instructions for the food. By including this, it would significantly improve transparency between the AMS Food Bank and consumers in terms of the source and contents of recovery food. Moreover, the inclusion of preparation instructions would contribute to helping improve food literacy and helping individuals who lack the skills and knowledge to prepare the food. Currently this is possible given that the

food is from a known menu and the chefs already know the exact portioning, ingredients and nutritional data. By working together with the chefs, they can assist the development of simple instructions for food preparation and recovery with professional recommendations and guidance.

We will further describe our short- and long-term recommendations shown in Table 2 in the following section.

Table 2

Action Items Summary

Who	**Action**	**Addresses**	**Timeline**
AMS C&C and AMS Food Bank	Establish communication (i.e. google sheets) between AMS C&C and AMS Food Bank	Consistency	Short-term
AMS C&C and AMS Food Bank	Develop a standard operating procedure for an ambient food recovery program → start ambient food recovery	Consistency	Short-term
AMS C&C and AMS Food Bank	Apply for recommended funding	Cost	Short-term
AMS C&C and AMS Food Bank	Waiver form, nutritional labelling and food preparation instructions to establish traceability	Traceability, food safety	Short-term
UBC	Implement food recovery language into CAP and ZWAP, develop food policy	Policy	Long-term
AMS C&C and AMS Food Bank	Develop standard operating procedure for hot food recovery	Consistency	Long-term

5.1.1 SHORT TERM RECOMMENDATIONS:

We believe the majority of our proposed short term recommendations can be implemented relatively immediately and should be featured under prioritized actions.

An immediate short-term recommendation for developing infrastructure would include an open line of communication through software like Google Sheets (Appendix 8). This would allow AMS C&C to inform the AMS Food Bank of any pertinent information to food recovery. This information should be comprised of specific details that pertain to the size and type of event, and to the potential food items so that the consistency barrier is addressed in terms of:

- helping the Food Bank plan a pick up day
- ensuring that there is enough storage space in the Food Bank for the recovered food
- providing a way for the two organizations to communicate with each other

Another immediate recommendation would be the inclusion and focus on the recovery of ambient food. Current concerns with liability prevent AMS C&C staff from directly taking any food home from events. As a result, a substantial amount of food is wasted along with not capitalizing the opportunity for recovering food. The use of ambient food would significantly improve the variety and volume of the Food Bank and serve as a precursor to the food recovery program. The greatest advantage of ambient food is that it does not require strenuous storage or preservation efforts, making it more economically feasible to recover. Despite not being as nutritionally valuable as whole meals, ambient food will help fill caloric deficits without any level of complex preparation or effort. This method can be implemented into the Zero Waste Action Plan and addresses the sustainability efforts in the Climate Action Plan, which we explain further in long-term actions and future research.

Another recommendation would be to develop the transparency aspect of the Food Bank. As mentioned before in traceability, the inclusion of more relevant and useful information to the consumer would generate more food literacy in consumers as the Food Bank reported that their general audience lacks extensive food preparation skills.

5.1.2 LONG-TERM RECOMMENDATIONS:

Our primary long-term recommendation is that UBC should look to amend language in their own policies and develop existing infrastructure and services that support the formation of a formal food recovery program

within AMS Operations. Amendments in policies for the UBC Climate Action Plan would specifically place our recommendations into the "priority actions" (Campus Community and Planning, 2010, page 29) section. More specifically, under priority action 5 which states to "continue to explore opportunities to address emissions reductions related to food". Food recovery is a way for UBC to further implement this action as it decreases food waste, which attributes to greenhouse gas emissions reductions (FAO, 2013).

Likewise, the inclusion of food recovery in literature should fall under the "priority actions" (page 20) and "waste reduction and re-use" (Campus Community and Planning, 2014, page 21) section for the Zero Waste Action Plan. Currently, ZWAP addresses food waste by collecting food scraps, but waste reduction could be addressed by capitalizing on the opportunity of food recovery as a potential solution for human consumption.

Literature in these policies is a starting point for the opportunities of repurposing food to be discovered. The avenues of expanding the scope of the program can be explored outside of AMS C&C and the AMS Food Bank. This could generate additional support from within UBC and outside the community by working together with local restaurants, the UBC Farm and Enactus.

UBC can also look to form a food policy similar to Canada's National Food Policy which could incorporate the previously mentioned amendments to both CAP and ZWAP. Future LFS 450 classes may be able to start the policy development process relatively soon, but we acknowledge that the actual development of policy is typically a longer process.

Another long term recommendation outside of policy reformation is the prioritised development of a formalized SOP. Development of a SOP would require long term commitment as the inclusion of food recovery in current operations would need to consider all logistical factors, but as per our discussion, is a necessary part of the food recovery process.

5.2 RECOMMENDATIONS FOR FUTURE RESEARCH

For future research, AMS Operations could look to apply our current data or assign another LFS 450 project to continue improving the status of an effective food recovery program in UBC. Specifically, future LFS

classes could focus on ambient food recovery and aid AMS Operations with developing a more short-term food recovery program. This ambient food recovery program could then be researched further to develop a prepared food recovery program, which we identified as more of a long-term action item based on the current barriers. Additionally, future LFS groups may want to increase the scope of the research to include service staff or kitchen staff as per our intended primary data collection methods as it could include more perspectives.

Another area of research would be a more in-depth review of current food recovery policies in Canada and in other countries to provide a framework for the implementation of food recovery language into UBC policies. While we have discussed applicable UBC policies to implement food recovery language in and the sections they could be placed in, there is still room to expand as we did not focus on policy in great detail. The expansion of this research can allow student perspectives to shape the formation of food policies at UBC.

6. CONCLUSION

In conclusion, this report has been an insightful experience by teaching us how organizations operate within universities, as well as how catered events and food banks operate. It has also taught us how to analyze certain policies and has allowed us to apply our social skills in a professional manner. Throughout this project we have been honing the skills that pertain to our assigned roles and we have learnt much of these skills from each other. More importantly, it has given us the information to identify the logistics behind making recommendations for a food recovery strategy being implemented among these two organizations. Specifically, we have identified the common barriers of labor, infrastructure, cost, and accountability that prohibit the implementation of a sustainable strategy. We also found the barriers of cost, food safety risks, and lack of policy in literature and discussed how these related to the barriers we observed in person. These barriers are further blockaded due to the financial implications pertaining to infrastructural investments and staffing. From these barriers, we have provided our personal recommendations that can help overcome these challenges, which are also based on our secondary data results. This project has the opportunity to be expanded on in terms of the development of new policies that pertain to food recovery at UBC or new projects that focus on developing a SOP. A successful ambient food recovery program in the short-term can be implemented, which will determine whether it can be adapted to fit a prepared food recovery program in the long-term. The steps AMS Operations take based on our project and future research

could in turn be included as a policy example or guideline. Lastly, we want to thank our project partners, SEEDS representatives and course instructors for giving us this opportunity to make a difference.

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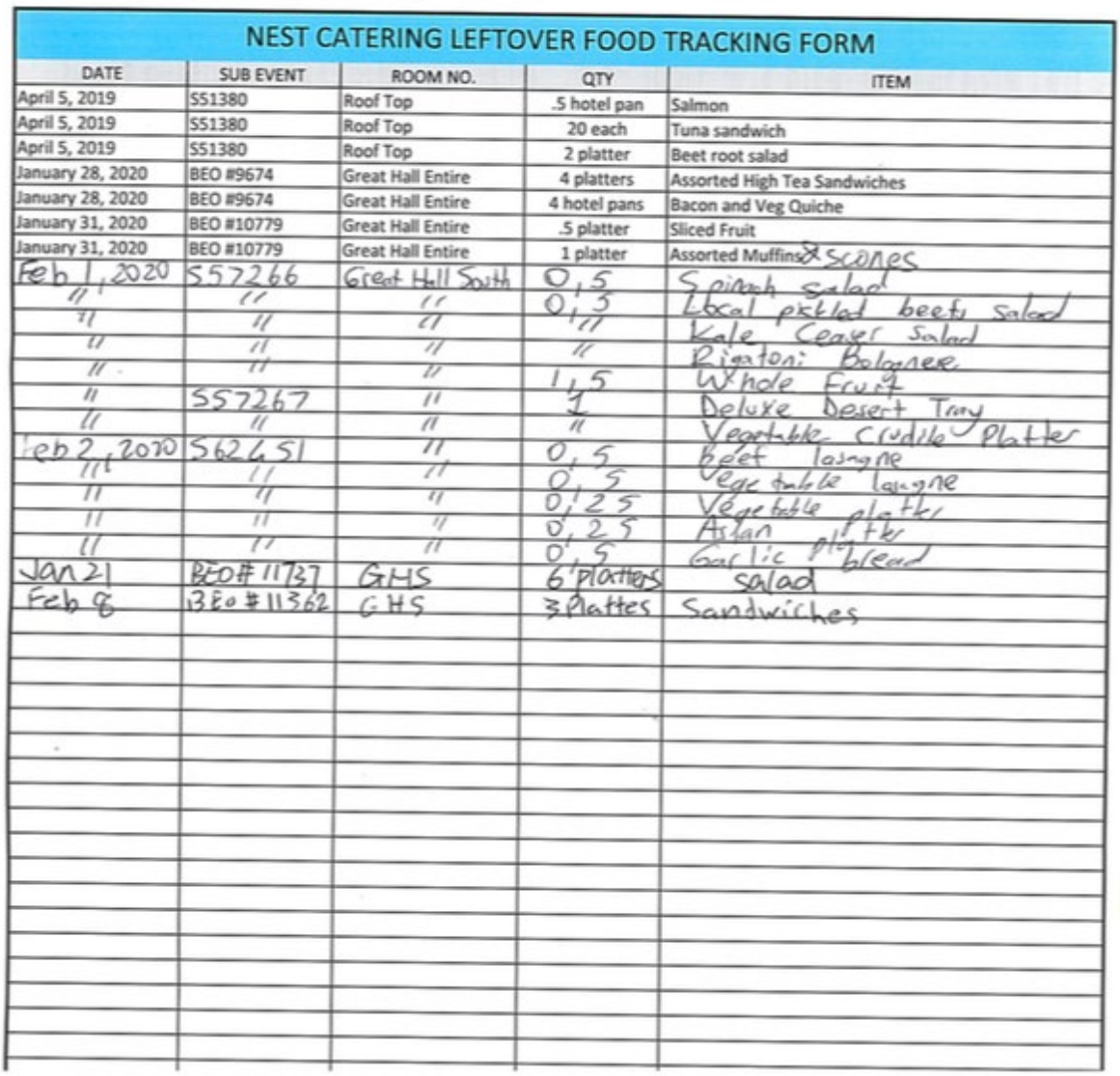
APPENDICES

Appendix 1

AMS C&C Waste Log (Photo by Christine Halonen)



NEST CATERING LEFTOVER FOOD TRACKING FORM

DATE	SUB EVENT	ROOM NO.	QTY	ITEM
April 5, 2019	S51380	Roof Top	.5 hotel pan	Salmon
April 5, 2019	S51380	Roof Top	20 each	Tuna sandwich
April 5, 2019	S51380	Roof Top	2 platter	Beet root salad
January 28, 2020	BEO #9674	Great Hall Entire	4 platters	Assorted High Tea Sandwiches
January 28, 2020	BEO #9674	Great Hall Entire	4 hotel pans	Bacon and Veg Quiche
January 31, 2020	BEO #10779	Great Hall Entire	.5 platter	Sliced Fruit
January 31, 2020	BEO #10779	Great Hall Entire	1 platter	Assorted Muffins & scones
Feb 1, 2020	S57266	Great Hall South	0,5	Spinach salad
"	"	"	0,5	Local pickled beets salad
"	"	"	"	Kale Ceaser Salad
"	"	"	"	Rigatoni Bolognese
"	"	"	1,5	Whole Fruit
"	S57267	"	1	Deluxe Desert Tray
"	"	"	"	Vegetable Crudite Platter
Feb 2, 2020	S62451	"	0,5	beef lasagne
"	"	"	0,5	Vegetable lasagne
"	"	"	0,25	Vegetable platter
"	"	"	0,25	Asian platter
"	"	"	0,5	Garlic bread
Jan 21	BEO# 11737	GHS	6 platters	salad
Feb 6	BEO # 11362	GHS	3 Platters	Sandwiches

Appendix 2
Stakeholder Meeting Agendas (ordered by date)

January 22nd, 2020

TIME	ITEM	PURPOSE / DECISION POINT
25 min	**Item 1:** AMS Catering/Food Bank Priorities and discussion of goals, deliverables etc.	1. Review priorities of AMS Catering and Food Bank to build a more relevant internal framework for research proposal and determine the status of the relationship between AMS Catering and the AMS Food Bank 2. Determine the current relationship between stakeholders **Decision Points:** ● Agree upon a collective purpose and goals - clarify vision ● Determine which current sustainable policies stakeholders are following
15 min	**Item 2:** AMS Food Bank Logistics	1. Discuss the logistics of the AMS Food Bank such as feasibility of perishable food storage/distribution, storage capacity, number of customers etc. **Decision Points:** ● Determine the degree to which the AMS Food Bank is able to store/distribute recovered food ● Establish directions for research on risks of food recovery ● Clarify objectives and deliverables
15 min	**Item 3:** AMS Catering Logistics	1. Discuss the logistics of AMS Catering such as storage capacity, catering event frequency, current procedures for uneaten food etc. **Decision Points:** ● Determine the storage capability of AMS Catering ● Clarify objectives and deliverables
10 min	**Item 4:** Review of AMS Catering Menu	1. Discover popular menu choices (both meal type and options within each meal type) 2. Explore known avenues for food recovery **Decision Points:** ● Isolate common waste items ● Target specific food items that can be feasibly recovered
10 min	Rolling Agenda Items (time pending)	1. Gain clarification on smaller-scale components of each stakeholder organization 2. Suggest potential avenues for collaboration 3. Explore methods of promoting AMS Food Bank (e.g. social media)
5 min	Wrap-up	Reflection and actions for next meeting/establishment of communication methods

February 12th, 2020

TIME	ITEM	PURPOSE / DECISION POINT
10 min	**Item 1:** Project Proposal	1. Review the project proposal document to ensure research proposed fits both organization's needs/goals 2. Address any concerns regarding the direction of the project moving forward **Decision Points:** ● Determine if the proposal needs additional tweaking specifically in project deliverables

		● Clarify research proposal
10 min	**Item 2:** Data Collection Methods	1. Discuss the proposed methods of data collection **Decision Points:** ● Identify if our proposed methods are feasible for both organizations ● Set up days which we can collect data ● Identify potential staff to interview ● Clarify payment method for AMS Staff
10 min	**Item 3:** David Speight Interview Debrief	1. Discuss the insight provided from our interview with UBC Food Service executive chef David Speight on food recovery at UBC **Decision Points:** ● Identify what strategies can be adopted by AMS C&C/FB
10 min	**Item 4:** Present Potential Alteration in Initial Scope of Project	1. Propose alternative suggestions to food recovery based on current primary/secondary research **Decision Points:** ● Determine if we create a strategy based on previous vision, or if we alter the strategy based on current research
5 min	**Item 5:** Review AMS C&C Waste Log	1. Review the waste log provided by Christine to gain a better understanding of its content **Decision Points:** ● Determine how we can implement this information into our research
5 min	Wrap-up	Reflection and actions for next meeting

March 4th, 2020

Time	**Item**	**Purpose/decision point**
~15 min	Item 1: Project proposal	1. Review project proposal research section 2. Finalize deliverables Decision points: 1. Alter deliverables to suit C&C
~20 min	Item 2: Literature review	1. Review key points from group member literature reviews Decision points: 1. Create a document that summarizes individual literature reviews
~10 min	Item 3: Project data recruitment strategy	1. Discuss how data will be collected

		Decision points: 1. Interviews with Chef Vishwa and Sophorn 2. Will use interviews and reports from partners.
~5 min	Item 4: Discuss overall project goals	1. Discuss next steps Decision points: 1. Focus on how we plan to address the discussed barriers 2. Develop strategy around barriers

March 25th, 2020

Note- Our only agenda item for this meeting was to go over our primary and secondary data results with our project partners and prepare for our presentation the following week.

Appendix 3

Meeting Agenda with David Speight

TIME	ITEM	PURPOSE / DECISION POINT
10 min	**Item 1:** Review status of previous food recovery plan	1. Clarify if the program is ongoing **Decision Points:** ● Determine if the strategy outlined worked (YES*) Goal 1: - Reduce food waste at the source Goal 2: - Never can be 0, so keep it on campus
10 min	**Item 2:** Challenges/Successes of past collaboration	1. Explore why or why not the project is still ongoing **Decision Points:** ● Identify key barriers (transportation - AMS FB can do this) ● Identify what went well (volunteers) ● Identify if it could be feasible
10 min	**Item 3:** Infrastructure	1. Identify what exactly was required in terms of infrastructure **Decision Points:** ● Determine the storage capability of UBC FS ● Determine what we might need for AMS Ops
10 min	**Item 4:** Review of labor costs	1. Discuss man-hours needed for program **Decision Points:** ● Target major areas of labor cost ● Determine differences between UBC FS and AMS
10 min	Rolling Agenda Items	1. Gain clarification on smaller-scale components of UBC FS 2. Inquire if UBC FS would be interested in joining the proposed AMS project 3. Inquire about potential references
5 min	Wrap-up	Establish future line of communication

Appendix 4 - *Interview Questions for Vishwa Mohan (AMS C&C Executive Chef)*

1. What is the current recovery/composting strategy employed by the kitchen after an event?

2. We identified that ___ had the best potential for food recovery from Sophorn. Of these menus, which type of food do you think would be most appropriate for recovery based on your current infrastructure/staff?
3. What is the current volume of food wasted/marked for disposal from events?
    a. Review waste log to obtain information on how much each quantity is in simple terms (i.e. servings)
4. What are the current tasks that kitchen staff are required to do?
    a. Which takes the most time?
    b. Which takes the least time?
5. Who inspects the food for temperature and labelling for food safety?
    a. Roughly how long would it take to do this an additional time before it would be packaged?
6. If the task of packaging recovered food were to be the duty of kitchen staff, who would be in charge of overseeing the process?
7. Approximately how long do you think it would take for you staff to package leftover food into 1-2 portion containers assuming the leftovers are from a standard 3-day conference?

Appendix 5- *Interview Questions for Sophorn Kong (AMS C&C Operations Manager)*

1. What are the potential catering events lined up for the rest of term, summer and fall?
    a. Capacity of people attending an event?
    b. Volume and type of food being distributed at the event?
2. What events would have the best potential for food recovery?
3. What are the current tasks that serving staff are required to do during a catered event?
    a. What takes the most time?
    b. What takes the least time?
4. How many staff are typically required for a banquet?
    a. How is that determined?
5. What are the typical shift lengths (hours)?
6. What is currently done with food that is leftover after an event?
7. If packaging of uneaten food was to be done into 1-2 portion containers from the event mentioned in question 2, approximately how long do you think that would take?
8. Who would be in charge of packaging food?
    a. Would you need to have additional staff/volunteers to package food or could it be feasibly incorporated into current tasks?
9. Have you had to incorporate any new tasks recently?
    a. Did C&C staff respond well to these changes or did it take some time to get used to them?

Appendix 6

Interview & Meeting Timeline

Date	**Attendees**	**Meeting or Interview**
January 22nd, 2020	Cali Schnarr, Christine Halonen, David Gill, Ernielly Leo	Meeting
February 6th	David Speight	Meeting
February 12th	Cali Schnarr, Sophorn Kong, Ernielly Leo	Meeting
March 4th	Cali Schnarr, Sophorn Kong, Ernielly Leo	Meeting
March 6th	Vishwa Mohan	Interview
March 6th	Sophorn Kong, Ernielly Leo	Interview
March 25th	Cali Schnarr, Christine Halonen, Sophorn Kong, Ernielly Leo	Meeting

Appendix 7

Waiver Form

THE UNIVERSITY OF BRITISH COLUMBIA

AMS Food Recovery Waiver Form

This Agreement is dated _____ ___, 20__ between AMS Conferences & Catering ("Donor") and the AMS Food Bank ("Recipient").

When AMS Conferences & Catering has and will have leftover safe, edible prepared foods ("Goods") , AMS Conferences & Catering wishes to donate such prepared foods to the AMS Food Bank, pursuant to the terms of this Agreement.

1. LIABILITY. The Food Donor Encouragement Act in British Columbia protects who donates food, or who distributes the Goods, to another person is not liable for damages resulting from injuries or death caused by the consumption of the food unless

(a) the food was adulterated, rotten or otherwise unfit for human consumption, and
(b) in donating or distributing the food, the person intended to injure or to cause the death of any person who consumed the food or acted in reckless disregard for the safety of others.

2. **INSPECTION.** Recipient is food safe certified and acknowledges inspection of each donation of the Goods, and satisfaction with their condition.

3. **DONATION; FREE DISTRIBUTION**. Donor hereby donates the Goods to Recipient. Recipient represents and warrants that (i) the Goods will be distributed for free to Recipient's clients, (ii) Recipient is a nonprofit organization that is operating for charitable, or educational purposes and does not provide net earnings to, or operate in any other manner that inures to the benefit of, any officer, employee, or shareholder of Recipient, (iii) Recipient is knowledgeable of the standards to properly recondition donated food and (iv) Recipient is not providing anything of monetary value to Donor in consideration of the Goods.

DONOR	RECIPIENT
Signature: _____Date: _____	Signature: _____Date: _____
Print Name/Title: _____	Print Name/Title: _____

Appendix 8

Google Sheet for AMS C&C and AMS Food Bank Communication