Operation Food Rescue:
Minimizing Food Waste at SFU Burnaby
Research Paper and Guide

Kimberly Ng
December 7, 2018
SD 494

Figure 1. “42.4 kg of food found in New Zealand household rubbish bins,” 2014
Contents

Executive Summary......................................................................................................................... 3
Introduction ...................................................................................................................................... 3
Context............................................................................................................................................. 4
  Common issues contributing to food waste for businesses ............................................................ 4
  How reducing food waste aligns with goals .................................................................................. 5
  Food recovery hierarchy .............................................................................................................. 6
  Figure 2: Food Recovery Pyramid ................................................................................................ 8
What SFU is currently doing Embark Sustainability ................................................................. 8
  SFU Meeting, Event, and Conference Services (MECS) and Sodexo ........................................ 9
  What other universities are doing ............................................................................................... 10
  University of Northern British Columbia (UNBC) ...................................................................... 10
  University of British Columbia (UBC) ........................................................................................ 11
  Virginia Polytechnic Institute and State University (Virginia Tech) ........................................... 12
Recommendation - Food waste guide ............................................................................................ 14
  Case Study: Steve’s Poké Bar ...................................................................................................... 15
  Case Study: Renaissance Coffee .................................................................................................. 15
  Business benefits ......................................................................................................................... 16
  What businesses can do ............................................................................................................... 17
    Prioritization, systems thinking and the circular economy ....................................................... 17
    Get the whole staff involved ....................................................................................................... 18
    Donate appropriate and safe leftovers ....................................................................................... 18
Conclusion ........................................................................................................................................ 20
References ......................................................................................................................................... 21
Appendix A ....................................................................................................................................... 23
Appendix B ....................................................................................................................................... 27
  Interview Questions with SFU MECS and Sodexo ................................................................. 27
Appendix C ....................................................................................................................................... 27
  Interview Questions with Steve’s Poké Bar and Renaissance Coffee ......................................... 27
Executive Summary

This project looks at minimizing food waste at Simon Fraser University’s (SFU) Burnaby campus through researching existing challenges, best practices, and current legislation. Food waste is the loss of food that occurs at the end of the food chain due to retailers’ and consumers’ behaviours (FAO, 2011). The aim was to focus on Meeting, Event and Conference Services (MECS) at SFU to help the organization reduce their food waste. However, after speaking with MECS and realizing logistical issues, the project shifted to creating a food waste guide that all food vendors on the Burnaby campus could use to minimize their food waste (See Appendix A). The guide would accompany the Sustainability Office’s Sustainable Spaces Program. The idea was to create a short, compelling story to help food vendors reduce their food waste through education. Instead of shaming and blaming people, this comprehensive guide aims to motivate and encourage vendors to change through simple, feasible actions. As well, it focuses on cost savings and provides a strong business case for businesses to reduce their food waste.

Introduction

Food loss occurs at every stage along the supply chain. In the medium- and high-income countries a significant amount of food loss occurs during the consumption stage where food is still fit for human consumption (FAO, 2011). Food loss that occurs at the end of the supply chain, relating to retailers’ and consumers’ behaviour is called “food waste”. Globally, it is estimated that one-third of food produced for human consumption is lost or wasted which amounts to 1.3 billion tons per year (FAO, 2011). In Canada, food waste is a significant issue as about 40 percent of food produced and distributed never gets eaten (Gooch & Felfel, 2014). Furthermore, in universities worldwide, an estimated 540 million tonnes of food waste are created annually. (Painter, Thondhlana, & Kua, 2016). Thus, food waste is a pervasive issue globally, nationally and within universities with many negative consequences.

From an environmental standpoint, food loss creates a waste of resources used in production including land, water, energy and inputs. As well, food loss contributes to pollution through the unnecessary use
of fuel used during food production and transportation. In the landfill, food waste creates methane which is a greenhouse gas that is 25 times more potent than CO2 (Carriere, 2017). Food loss also creates social consequences as it impacts food security including food quality and safety, and economic development, especially for poorer people (FAO, 2011). Economically, food loss contributes to wasted time, money and countless other resources throughout the supply chain. Furthermore, avoidable food losses directly impact the income of both farmers and consumers as inefficiencies in the food supply chain equate to higher costs. In Canada alone, it is estimated that the quantifiable value of food waste is $31 billion (Gooch & Felfel, 2014). Therefore, food waste creates environmental, social and economic consequences, especially for businesses.

Context

Common issues contributing to food waste for businesses
To minimize food waste, it is first important to address the common issues that contribute to the problem. From the perspective of Canadian food vendors, 18 percent of food waste occurs during the production and manufacturing stage of the food chain (Carriere, 2017). This is often due to overstocking, lack of communication, cancellation of orders, or wasteful production methods. Although a baseline of five to seven percent of waste due to overproduction is inevitable, a company’s total output of food waste can reach up to 56 percent which means more food is wasted than sold (Carriere, 2017). Furthermore, if there is an overproduction of food, many vendors do not donate their products and instead send perfectly edible food to the landfill.

There are many reasons for wasting food such as irregularities or blemishes, the current market situation, overproduction, or packaging errors (Schneider, 2013). However, wasting food that could be donated is an awful waste of resources. Some businesses cite that they do not donate food because coordinating donations requires effort from staff or volunteers which ties up resources. Other barriers to food donation include uncertainty about which local charities accept food, an unreliable pick-up
service, a lack of adequate cold-storage, an uncertainty with what foods can be donated and a lack of set procedures for food donations (McIntyre, n.d.). Additionally, the fear of potential liability and apprehension surrounding hygiene regulations and food safety practices are large barriers to donation (McIntyre, n.d.). Food waste is a symptom of ineffective and inefficient processes so instead of seeing food waste at the problem, it should be viewed as a symptom of an uncoordinated value chain (Gooch & Felfel, 2014). Thus, this guide aims to help businesses address these common issues by providing information about prioritization, staff organization, systems thinking, food donation legislation and local organizations that accept donations.

**How reducing food waste aligns with goals**

Recently, food choices and climate change are topics that have been quickly gaining attention. In the latest Intergovernmental Panel on Climate Change (IPCC) report, a clear limit was set, “we must limit global warming to 1.5 degrees above pre-industrial levels to avoid devastating impacts and tipping points for runaway climate change” (2018). This report calls for dramatic cuts to food waste and a focus on shortening supply chains. The choices that we make, especially demand-side, efficiency measures, and lifestyle choices can help support sustainable development. Limiting the demand for energy, resource and GHG-intensive foods, along with reduced food loss and waste, could reduce emissions and increase climate change adaptation options (IPCC, 2018). These choices reduce both emissions and pressure on land as well as co-benefits for food security, human health and sustainable development.

As well, addressing food waste has also been included in the United Nations Sustainable Development Goals (SDGs). In September 2015, the United Nations General Assembly adopted a set of 17 Sustainable Development Goals as part of the 2030 Agenda for Sustainable Development. Goal 12 aims to ensure sustainable consumption and production patterns. In particular, target 12.3 calls for “halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains (including postharvest losses) by 2030” (Lipinski et al., 2017). Thus, minimizing food waste
is an important way to work towards sustainable development. However, what needs to be done is different for various parts of the world and achieving SDG Target 12.3 will require action from both big players and millions of acts by everyone. As Lipinski et al. state, this is an ambitious target, yet it is achievable and now more than ever has the “potential to embed the reduction of food loss and waste firmly in public and private sector strategies” (2017). This target also contributes to realising other international aspirations including the Zero Hunger Challenge, the United Nations Framework Convention on Climate Change, and more.

Locally, reducing food waste also relates to SFU’s sustainability goals. In March 2017, the University launched the finalized 20-Year Sustainability Vision and Goals (“SFU launches community-developed 20-year sustainability vision and goals,” 2017). The vision includes plans for the university to be a globally recognized leader in sustainability, become a zero-waste university, move towards 100 percent renewable energy and more. In relation to this project, SFU strives towards contributing to a vibrant and resilient local food system on campus and within the region. As local businesses donate leftover food, SFU and community members will contribute to the distribution of their own food for communities where the campuses are embedded. Through this project, SFU will continue to create strong embedded university-community relationships which contribute to community resilience. Therefore, minimizing food waste is not only important for global goals but local ones as well. It is also evident that there is a hierarchical process in reducing food waste where the first step is to reduce the surplus creation of food in the first place.

**Food recovery hierarchy**

The National Zero Waste Council proposed a strategic approach to minimizing food waste. This aims to close the loop on food waste occurring throughout all steps of the linear food value chain and supports the shift to a circular value chain (*A Food Loss and Waste Strategy for Canada*, 2018). The first step in food loss and waste strategy is to prevent and reduce the volume of surplus food generated in the first
place (see Figure 2). By reducing the surplus volume of food, pollution related to the production of unused food also lowers. This includes fertilizers, pesticides and the energy associated with growing, preparing and transporting the food. Furthermore, there are economic benefits from saving resources and the economic costs increase the further down the food chain the food is wasted (A Food Loss and Waste Strategy for Canada, 2018). So, food wasted at the consumer level is more expensive than when it is being grown. Investments in uneaten food are then pushed to companies and ultimately consumers. Therefore, the priority is to prevent and reduce the creation of surplus food and when there is excess food it should be donated. The second step in the strategy is to recover for people. This step occurs when there is a surplus of food and it is donated to community organizations and non-profits who organize food programs. By developing programs that help neighbourhoods share food more effectively, it helps to build community resilience and connection (A Food Loss and Waste Strategy for Canada, 2018). If donating to local communities is not an option, the next step is to recover the food for livestock. This preserves the value of food as an input into further food production rather than turning the scraps into garbage (A Food Loss and Waste Strategy for Canada, 2018). Although steps one, two and three aim to reduce the creation of surplus food and recover nutritious food, these strategies will take time to produce effective results and cannot eliminate food waste completely. The next step is to prevent food waste from entering the landfill and to capture the embedded energy and nutrients from the food through composting. As mentioned previously, methane emissions are produced from the decay of organic materials in a landfill and are 25 times more potent than CO2 emissions so reducing landfill inputs as much as possible is imperative (Carriere, 2017). Finally, if there are no other alternatives, the very last option is to dispose of the food in the landfill. With the strategy in place, this project aims to focus on step one and two of the hierarchy by helping businesses reduce their food surplus and by providing information on ways to recover the food for human consumption.
What SFU is currently doing

Embark Sustainability

Embark sustainability is an independent, student-led non-for-profit based out of SFU. It empowers the next generation of student sustainability leaders. Their mission is to engage students in change making and to inspire their sustainability leadership through grants, advocacy and student-designed programming (“About - Embark Sustainability,” 2018). One area of priority that Embark identified in their strategic plan is food systems change. There is a focus on promoting personal and cultural connections to food systems by promoting nutritious and sustainable food production, distribution, and access. One program that Embark runs is the Food Rescue Food Program on Simon Fraser University Burnaby campus. The group is partnered with Nesters Market, where, healthy yet imperfect-looking produce that does not meet the selling criteria of supermarket chains are collected (“Food Rescue - Embark Sustainability,” 2018). Through volunteer efforts, leftover produce is redistributed two times a week to the university community for free or by donation (“Food Rescue - Embark Sustainability,” 2018). This program is a great example of the “Recover for people” step in the food recovery hierarchy, saving
significant kilograms of food from ending up in the landfill. As well, this program recognizes that food waste is an issue on SFU Burnaby campus and that there are attainable steps to mitigate the issue.

**SFU Meeting, Event, and Conference Services (MECS) and Sodexo**

When researching the current state of food waste at Simon Fraser University, it is important to look at Meeting, Event, and Conference Services (MECS) and Dining Services. MECS exclusively handles catering for meetings, events and conferences. On the other hand, SFU Dining Services oversee a wide variety of food vendors. Furthermore, Dining Services manages Sodexo, a food services and facilities management company, who runs the university’s food vending locations. Therefore, Sodexo is the actual food provider. In total there are nine food vending locations on the Burnaby campus including Dining Hall by Residence, the Diamond Alumni Centre, Discovery Café, Starbucks (Cornerstone at UniverCity and West Mall locations), Mackenzie Café, West Mall Express, Junction 65 and Smoke’s Poutinerie.

After interviewing the Associate Director of MECS from the Burnaby campus and the General Manager of Sodexo at SFU, the scope of the project changed. The original scope was to facilitate minimizing food waste from SFU MECS or Dining Services through research to reduce surplus food, implement food waste tracking or opportunities for food donation. It was noted that there is a demand from the community towards reducing food waste and that there is a shift towards reducing wasted food (Jutras, 2018). However, it was found that Sodexo does not create a lot of food waste and was not interested in exploring food donation since it is such a large organization and organizing the logistics would not be feasible at this time (Abreo, 2018). As well, food donation was not considered due to the fear of potential liability and apprehension surrounding hygiene regulations and food safety practices. Thus, the project was re-evaluated, and it was decided that a guide to help food vendors reduce their food waste would be the best option moving forward.
What other universities are doing
When looking at food waste reduction at SFU, it is also important to see what other universities are implementing to tackle this pervasive issue. By looking at best practices both locally and internationally, it is evident that there are many different options to combat food waste. These examples provide opportunities for SFU to learn from.

University of Northern British Columbia (UNBC)
The University of Northern British Columbia was chosen as a case study because it is like SFU in terms of placing sustainability as a strong focus. Although UNBC has a smaller student population, it is located in the same province and therefore has similar legislative characteristics. In 2007, the University of Northern British Columbia assumed the trademark of Canada’s Green University (Rajan, Fredeen, Booth, & Watson, 2017). As such, sustainable food waste strategies have always been central to UNBC’s campus sustainability mission. In one study, researchers conducted food waste audits at the Prince George campus in central British Columbia. The project sought to help inform strategies to reduce avoidable food waste, optimize waste collection facilities for the campus food services, and assist the university in diverting 100 percent of all unavoidable food wastes into compost facilities (Rajan et al., 2017). The audits aimed to obtain information on the spatial (e.g., catered vs. normal dining area in the cafeteria), qualitative (e.g., avoidable vs. unavoidable), and quantitative (e.g., pre-consumer vs. post-consumer) aspects of food waste generated from the two primary foodservice operators on campus (Rajan et al., 2017). Evidently, the most appalling food wastes are those that are both avoidable and fully prepared for consumption, these carry the highest levels of embedded energy. The waste audits found that plate scrapings were the largest component of total cafeteria food waste (Rajan et al., 2017). Thus, wasting served food is a considerable concern to UNBC. It was noted that reducing the wastage of this fully prepared food can be achieved through reduction or reuse and redistribution to the food insecure (Rajan et al., 2017). This is similar to the steps that the National Zero Waste Council’s Food Recovery Hierarchy proposes.
Another intervention to reduce campus catering food waste was to create an informal system of word-of-mouth, text, and e-mail notifications. These messages inform others of catering surpluses that would otherwise enter the waste stream. In relation to SFU food vendors, it would not be the best solution to create an informal communication network for food donation due to liability issues. However, SFU food vendors can learn from UNBC and conduct regular waste audits to improve waste management procedures to enhance their waste management plans.

University of British Columbia (UBC)
The University of British Columbia was also chosen as a case study due to its relative similarities to SFU in both location, size and legislative characteristics. As well, sustainability is a large focus for the university as UBC was the first Canadian university to adopt a sustainable development policy and Sustainability Office with the intent of becoming a sustainability leader among North American universities (Rojas, Richer, & Wagner, 2007). One project that addresses UBC’s food system sustainability is the UBC Food System Project (UBCFSP). This project was created out of a recognition that our local, regional, national and global food systems are increasingly insecure and unsustainable (Rojas et al., 2007). The aim of UBCFSP is to assess the campus food system sustainability and identify barriers and opportunities to work towards food system sustainability. This project takes a bigger picture view of food system sustainability at UBC to see how adopting a whole of chain approach benefits the community.

Another tactic that UBC implements is to focus on diverting food waste from landfills at events. One study found that the second largest amount of waste created at a festival was food and kitchen waste (Zelenika, Moreau, & Zhao, 2018). The study also noted that behavioural factors helped to determine waste diversion rates such as infrastructure, environmental attitudes, social norms and sorting knowledge (Zelenika et al., 2018). In learning from this, it would be beneficial for SFU to work with all food vendors to ensure that the materials provided are standardized, consistent, and can be recycled or
composted in local systems. As well, the study recommended improved communication with students about the benefits of composting and the negative impacts of using landfills will be valuable (Zelenika et al., 2018). Thus, to reduce the amount of food waste that ends up in the landfill, it is both the food vendors duty to reduce surplus food but also consumers jobs to properly sort their waste.

Furthermore, another study based out of UBC looked at food waste from conferences. One of the recommendations that emerged was to provide attendees with an option to select a serving size (small or regular) (Kim et al., 2016). Smaller portion sizes would allow guests to choose the correct size for their appetite and less plate waste (uneaten food that has already been served) would occur. This is something feasible that SFU’s food vendors can implement to reduce edible food waste.

Another recommendation, specifically for meetings, events and conferences was to explore a “green tax” deposit system to help event planners fund food-redirection strategies (Kim et al., 2016). This idea revolves around event attendance. Conference organizers will pay a “green tax” deposit if fewer people than anticipated show up to an event (Kim et al., 2016). This creates an incentive to produce accurate attendance numbers to reduce the amount of surplus food made. Additionally, the funds could be used to buy containers for food donations or go to a local food bank. So, when evaluating UBC as a case study there are a variety of feasible actions to learn from. Ideas range from taking a big picture view of SFU’s sustainable food system to implementing a “green tax” for meetings, events, and conferences. For individual food vendors at SFU, more feasible options include standardizing food waste packaging and providing different options for serving sizes.

**Virginia Polytechnic Institute and State University (Virginia Tech)**

Virginia Polytechnic Institute and State University was chosen as another case study due to similar student population sizes (more than 30,000 full-time students) and to research how universities outside of Canada deal with food waste (Burton, Serrano, Cox, Budowle, & Duly-Nusbaum, 2016). Similar to UBC’s research on the relationships between serving size and plate waste, Virginia Tech researchers
found that all-you-can-eat campus outlets produce 53% more food waste than á la carte outlets (Sarjahani, Serrano, & Johnson, 2009). When students can choose their own serving size, they often serve too much food and it goes to waste. Therefore, having á la carte outlets who properly portion out meals can help reduce plate waste and lead to a reduction in the creation of surplus food.

As well, one Virginia Tech study focused on an important practice of food waste reduction which is commercial food tracking and weighing programs (Burton et al., 2016). Food tracking was found to help increase staff awareness around the volume and contributors to food waste. The pre-consumer waste was tracked every day, this includes spoilage, overproduction, trim waste, quality control, closing/end of night leftovers, or dropped food. A more detailed look at their food waste management protocol includes creating and maintain food waste stations complete with scales, bins, buckets and tracking forms (Burton et al., 2016). Each tracking form records the weight of food, location, product description, the reason for waste, disposal method (compost, diverted, or trash) and other comments (Burton et al., 2016). The data would then be transferred into an online tracking system. From this study, researchers found that the benefits of food waste tracking included perpetually reminding staff of their actions which increased responsibility, especially because the logs were signed by employees and reviewed by managers (Burton et al., 2016). This created an increased awareness and conscientiousness from employees while also creating immediate corrective action. On the other hand, some barriers to food waste tracking include logistical concerns, particularly a lack of space and ongoing training due to employee turnover and shift changes. Other barriers that were noted included difficulty in weighing some food items (particularly liquids), lack of communication and low compliance of fellow staff (Burton et al., 2016). SFU food vendors can learn from this study by noting the recommendations that Burton et al. provide. One suggestion is to develop a university-wide protocol that would support managers and employees in creating an effective waste management system at each dining facility. Another critical recommendation is to properly train staff to implement food waste tracking. One way to do this is to
employ permanent waste coordinators who are responsible for overseeing the waste tracking. Having someone responsible for tracking waste ensures that tackling the challenge is not forgotten or put-off.

**Recommendation - Food waste guide**

The aggregation of all this research on food waste can be summed up in a simple food waste guide (See Appendix A). This guide can be distributed to food vendors at SFU’s Burnaby campus and used alongside the Sustainability Office’s Sustainable Dining Certification. The certification program lets SFU food vendors improve their sustainability performance through the Sustainable Spaces Program. Becoming officially certified allows vendors to demonstrate to their customers and community that they are committed to reducing their economic, ecological and social impacts. The food waste guide is meant to be short and compelling to aid food vendors in reducing their food waste. As well, the comprehensive guide aims to encourage vendors to change their actions through simple, feasible activities and provides specific resources to vendors who may otherwise lack the knowledge about minimizing food waste.

Additionally, the guide focuses on cost savings and provides a strong business case for vendors to reduce their food waste, aside from solely environmental benefits. Providing the guide to food vendors in the new student union building was also proposed. However, upon further research, there will not be any food vendors in the new building.

The food waste guide begins with an introduction to the food waste issue, key statistics about food waste, and common issues contributing to food waste. Additionally, there are case studies from Steve’s Poké Bar and Renaissance Coffee. These organizations provide details on the activities they do to reduce food waste which can help businesses learn from what existing organizations do on a day-to-day basis. The guide also describes the business benefits of reducing food waste and outlines feasible activities that any business can implement. Finally, the guide sheds light on food donation legislation and provides resources to easily donate surplus food.
Case Study: Steve’s Poké Bar
Steve’s Poké Bar was chosen as a case study as they are already certified under SFU’s Sustainable Spaces Program. One way that the restaurant works to eliminate food waste through their operations is by tracking food waste (Huynh, 2018). Steve’s tracks fish waste on an excel spreadsheet to identify how much fish is being made and if there are any major changes from day to day. Other types of food waste such as vegetables are tracked daily and analyzed monthly (Huynh, 2018). Just as the Virginia Tech study noted, tracking food waste is an important step to help plan inventory and waste needs. As well, Steve’s uses specific timing so that at the end of the day, only a certain amount of product can be put out (Huynh, 2018). This reduces the creation of surplus food as only what is needed is made. Finally, the restaurant engages in food recovery as any leftovers are given to staff at the end of the day (Huynh, 2018). Upon further discussion, Steve’s Poké Bar would also be interested in donating leftovers with more resources and information.

Case Study: Renaissance Coffee
Renaissance Coffee was also chosen as a case study as the owner, Parminder Parhar, has been implementing sustainability practices in his organization for many years. Parminder believes he has a responsibility to be sustainable so that others will begin to be sustainable in their daily lives (Parhar, 2018). Additionally, Renaissance Coffee is also certified through SFU’s Sustainable Dining Spaces Program. One way that the cafés reduce food waste is through their food preparation practices. It was noted that most of the food waste is pre-consumer through food preparation. There are always two food preparation employees working to constantly check what needs to be topped up to minimize excess food production (Parhar, 2018). Also, Renaissance employees are all trained and responsible for the removal of waste and recyclable materials. The majority of employees are also long-term, meaning they are more knowledgeable and better understand the intricacies of food waste procedures.

Parminder also initiated partnerships with suppliers to provide daily deliveries of pastries in reusable cardboard boxes (Parhar, 2018). The supplier changes the liner sheet of the delivery box and refills the
box with pastries. The cardboard boxes are then used again until their end of life. Renaissance’s coffee bags are also delivered in reusable plastic containers. Finally, in terms of packaging, Renaissance Coffee replaced their single-use packaging to offer coffee condiments in bulk. Instead of using single-use sugar packets, consumers can now pour their sugar from a bulk container ensuring they use only what they need. As well, to reduce plastic use, the milk now arrives in larger 4L containers rather than in additional 1L containers.

**Business benefits**
It is evident that food waste causes large financial costs, especially as it does not occur in isolation. The energy, labour, water, and countless other resources used to produce and transport food are also wasted. Few opportunities exist for businesses to reduce their operating costs by 15 to 20 percent like reducing food waste does (Gooch & Felfel, 2014). As well, the food industry is hyper-competitive and minimizing food waste can increase profitability by the equivalent of 5 to 11 percent (Gooch & Felfel, 2014). Reducing food waste provides a strong opportunity for businesses to be more profitable and to actively contribute to a more sustainable world. As mentioned previously, along with financial gains, there are also environmental benefits to reducing food waste. Furthermore, making an effort to decrease food waste improves a business’ public image and marketability. Now more than ever, Canadians are increasingly looking for greener products and services and are basing their purchasing decisions on environmental claims. In fact, 86% of Canadians are buying green so putting sustainability first may help vendors gain and retain customers (“More Canadian consumers seeking green products and services in current economy,” 2014). Other business benefits also include improving a company’s corporate social responsibility while helping to attract dedicated staff and customers.
What businesses can do
Perhaps the most useful aspect of the guide is the section that teaches businesses what they can do to easily reduce food waste in their organization. The guide provides several options to reduce food waste from conducting a waste audit, using fine-tune forecasting or having a plan for leftovers.

Prioritization, systems thinking and the circular economy
One opportunity to reduce food waste is to conduct a waste audit. A business should figure out what they are throwing out and how much it is costing them. Knowing how much they are saving in waste disposal fees can help justify investing in food waste solutions. A useful link is also embedded in the guide to a webpage from Ever Green Environmental that provides further information on how to conduct a waste audit (“How To Conduct a Waste Audit,” 2014). Another option is to study an organization’s by-products. Often there are second uses for by-products such as rendering it into another product or something that another industry could use. Additionally, SFU food vendors can implement fine-tune forecasting. As a previous study from UBC found, overproduction and last-minute cancelled orders can create a lot of waste (Kim et al., 2016). More accurate forecasting models can help businesses spend less time guessing and more time maximizing the ingredients they have. A link to a webpage is also included in the guide to discuss forecasting methodologies (“Forecasting methodology and process for restaurants,” 2017). Along with fine-tune forecasting, a “green tax” could also be implemented to create a consequence for providing inaccurate attendance numbers.

Yet another tactic to reduce food waste is to use Enterprise Resource Planning (ERP) software. This helps a business track ingredients, analyze shelf life, avoid overstocking, create accurate inventory orders, and even avoid cross contamination (Carriere, 2017). Finally, by using systems thinking and adopting a whole of chain approach, businesses will be able to produce greater benefits and opportunities than if they focused on just themselves. A business must start by quantifying the issue and identify other businesses to partner with to improve the value chain’s performance (Gooch & Felfel, 2014). Then, with help from
key individuals from those businesses, they must determine the purpose of their project, assess the current situation, and estimate opportunities for success (Gooch & Felfel, 2014). Providing easily communicated information will allow businesses to rally people around a cause and get buy-in for the project throughout the value chain.

Get the whole staff involved
Other opportunities to reduce food waste involve organization and getting the whole staff involved. Just as the Virginia Tech study found, placing someone in charge of minimizing waste is very beneficial (Burton et al., 2016). It is important to ensure that there is a plan to use everything in the freezer and refrigerator to spoilage. As well, as the UBC study noted, portion controlling is a great initiative to reduce waste (Kim et al., 2016). If there are dishes that are rarely finished or garnishes that nobody eats it can be simple to cut back. A lot of plate waste can easily be avoided if portions are reduced, the presentation changes or garnishes are minimized. Another opportunity is to create a plan for leftovers. Whether staff can take them home like at Steve’s Poké Bar, they are turned into tomorrow’s soup, or sold at a marked down price, it is important to ensure that leftovers are part of a business’ planning (Carriere, 2017). As with all sustainable changes, educational efforts are also imperative to promote awareness and support for more sustainable practices and any proposed changes.

Donate appropriate and safe leftovers
The second step in National Zero Waste’s food recovery hierarchy is to recover food for human consumption (A Food Loss and Waste Strategy for Canada, 2018). Donating food is a thoughtful alternative to completely wasting it. However, many businesses are wary of donating food for a variety of reasons from uncertainty about which local organizations accept food, unreliable pick-up service, a lack of adequate cold-storage, an uncertainty with what foods can be donated and a lack of set procedures for food donations (Mcintyre, n.d.). A common misconception is that businesses should not donate food because of the perceived threat that they could be sued. However, in Canada, no reported
court decision has ever imposed liability on the industry, food donation organizations or any person for problems caused by donated food (*Food Donation and Civil Liability in Canada*, 2018). This guide hopes to remove some barriers that businesses face in donating perfectly edible food. For example, the guide contains a list of organizations in the Lower Mainland who accept and appreciate food donations.

**BC Food Donor Encouragement Act (FDEA) (1997)**

In April 1997, the government of BC passed the Food Donor Encouragement Act. The act encourages organizations to make donations of perishable food and provides a valuable source of nutrition to recipients. Donors are protected from liability when donating or distributing food, while also ensuring recipients’ rights are protected (*Food Donation and Civil Liability in Canada*, 2018). The FDEA applies to food donation organizations and to any corporation or individual who donates or distributes donated food (*Food Donation and Civil Liability in Canada*, 2018). Other aspects of the FDEA include details such as ensuring that a donor or distributor must have been dealing with food which was given without charge to be protected by the Act. Overall, the Food Donor Encouragement Act suggests that businesses that operate in good faith and exercise due diligence to food quality and safety are unlikely to experience issues with liability.

**BC Centre for Disease Control (BCDC) donation guidelines**

The BCDC provides guidelines that must be followed when donating food. Most notably, partially consumed food, food that has been on display in a public buffet or food which has left temperature control for over two hours can never be donated, regardless of the source (*Providing Nutritious and Safe Food: Guidelines for Food Distribution Organizations with Grocery or Meal Programs*, 2016). Some tips when donating food include offering donated dishes in shallow, one-use recyclable aluminium pans of clear plastic food-grade bags. As well, package bulk donations like soups in containers that allow for temperature control. Labelling and dating all containers so that they can be readily identified is also a good practice. When donating prepared leftovers, it is imperative that businesses follow the BC Centre for Disease Control guidelines which are also conveniently linked in the food waste guide.
Conclusion

In conclusion, food waste creates environmental, economic and social consequences. From the Sustainable Development Goals to SFU’s 20-year goals, food waste is a serious issue globally, nationally and locally. On a smaller scale, this project aims to reduce food waste through food vendors at Simon Fraser University’s Burnaby campus. Colleges and universities have a tremendous opportunity to be catalysts for positive social change through practices and policies they adopt, especially considering the number of students they serve. Thus, a food waste guide was created to help food vendors identify common issues, provide examples of local businesses making an impact and offer achievable opportunities to reduce food waste. Utilising the National Zero Waste Council’s food recovery hierarchy is helpful in addressing the challenge by creating concrete steps to focus us. The biggest priority is to reduce the creation of surplus food and then to recover any surplus for human consumption. Next steps for this project include researching funding opportunities to help food vendors take their sustainability initiatives to the next level. As well, partnering with local food donation organizations across the SFU campus could be an incredible opportunity to strengthen the community by working together to recover otherwise wasted food to give to those in need.
References

42.4 kg of food found in New Zealand household rubbish bins. (2014). Retrieved from https://upload.wikimedia.org/wikipedia/commons/6/63/42.4_kg_of_food_found_in_New_Zealand_household_rubbish_bins.jpg


Abreo, L. (2018, October 11). Interview with General Manager, Sodexo. (K. Ng, Interviewer)


IPCC. (2018). *IPCC Special Report on Global Warming of 1.5°C.*

Jutras, J. (2018, October 11). Interview with Associate Director, Meeting, Event, Conference Services. (K. Ng, Interviewer)


Introduction

Food waste is defined as the loss of food along the value chain that is suitable for human consumption or will be fit for consumption after processing.

It does not occur in isolation. In fact, it also results in wasted energy, water, land, labour, capital investment, infrastructures, machinery and transportation [1]. This is a serious issue as billions of Canadian dollars are wasted each year as a result of this food waste.

Furthermore, the latest Intergovernmental Panel on Climate Change (IPCC) report calls for dramatic cuts to food waste and a focus on shortening supply chains. The report states that both decreasing food loss and waste as well as behavioural changes around diets are effective options to mitigate the impacts of climate change. These improvements can reduce emissions and alleviate pressure on land and water systems. As well, this benefits food security, human health and sustainable development [2].

This guide includes common issues businesses face regarding food waste, case studies of several food vendors at SFU’s Burnaby campus and steps that new vendors can follow to decrease food waste in their business and increase financial efficiencies.

Additionally, this guide supports the Sustainable Spaces Dining vendors program, works towards SFU’s 20-Year Sustainability Goals. In particular, it strives towards contributing to a vibrant and resilient local food system on campus and within the region. By reducing food waste and working closely with suppliers and the community, food vendors at SFU’s Burnaby campus will continue to create strong embedded university-community relationships which contribute to community resilience.

1/3 of food produced worldwide goes to waste annually

$31B of food goes to waste in Canada

40% of food goes to waste in Canada annually

Common Issues Contributing to Food Waste

- Food waste not tracked due to logistical issues, particularly lack of space, ongoing training due to shift changes, and employee turnover.
- Apprehension around food safety and hygiene regulations prevent food donation activities.
- There are either no procedures in place to donate food, confusion about what foods qualify for donation or a lack of knowledge about which local charities can take food.
- Viewing food waste as the problem instead of recognizing it as a symptom of an uncoordinated value chain.
- Lack of recognition that there are realistic and achievable ways of dealing with food waste.


Case Study: Steve's Poke Bar

Steve's Poke Bar was chosen as a case study for this guide because they are already certified under SFU's Sustainable Spaces Program.

Steve's Poke Bar works to eliminate food waste through their operations by:

- **Tracking Food Waste**
  - Fish waste tracked on an excel spreadsheet to identify how much fish is being made and if there are any major changes.
  - All other food waste tracked daily and analyzed monthly.
  - The above helps to plan waste and inventory needs.

- **Specific Food Timing**
  - After certain time of day only a certain amount of product is allowed to be put out (time limits vary on type of product).

- **Food Waste Recovery**
  - Leftovers given to staff.
  - Open to donating food in the future.

Case Study: Renaissance Coffee

Parminder Parhar, owner of the Renaissance Cafés, has been implementing sustainable practices for many years. Parminder believes that he has a responsibility to take action to be sustainable so that others will begin to be sustainable in their daily lives. Renaissance Coffee is also certified under the Sustainable Dining Spaces through SFU’s Sustainable Dining Program.

The cafés work to eliminate food waste on Burnaby mountain through the following ways:

- **Food Preparation**
  - Two food preparation employees working at all times.
  - Constantly checking what needs to be topped up, minimizing excess food production.
  - Most food waste created through preparation (ex. peelings).
  - Most food waste after preparation occurs on Friday afternoons.

- **Deliveries in Reusable Containers**
  - Renaissance initiated partnerships with suppliers to provide daily delivery of pastries in cardboard boxes.
  - The supplier changes the liner sheet and cleans the boxes before filling with pastries. The cardboard boxes are used again until end of life.
  - Coffee bags are also delivered in reusable plastic containers.

- **Long-term Employees**
  - All employees are trained and responsible of the removal of waste and recyclable materials.
  - Most employees are long-term, so they are more knowledgeable and better understand the more intricate details of food waste procedures.

- **Coffee Condiments Offered in Bulk**
  - Replaced single use packages.
  - Sugar offered in bulk containers so consumers only use what they need.
  - Larger milk containers are used (4L instead of 1L) to reduce plastic use.
Business Benefits

Few opportunities exist for businesses to reduce operating costs and increase profitability to the extent that reducing food waste can. Thus, minimizing food waste provides a strong opportunity for businesses to be more profitable and contribute to a more sustainable world.

Addressing food waste provides these business benefits:

- Reduce operating costs by 15-20% and increase profitability by the equivalent of 5-11% [3].
- Maximize financial benefits.
- Improve public image and marketability.
- Better engage with the local community.
- Reduce your environmental impact.
- Improve Corporate Social Responsibility.
- Attract dedicated staff and customers.

What You Can Do!

Prioritization, Systems Thinking and the Circular Economy

- **Conduct a waste audit** (External Link)
  
  Figure out what you’re throwing out, why, and how much it’s costing you.

- **By-products**
  
  Study your by-products and research if there is a use for them. Can it be rendered into another product? Is it something another organization could use?

- **Fine-tune forecasting** (External Link)
  
  Overproduction and last-minute cancelled orders can cause a lot of waste. With more accurate forecasting models, you can spend less time guessing and more time maximizing the ingredients you have.

Get the Whole Staff Involved

- **Organize**
  
  Put someone in charge of minimizing waste and offer them a small (waste free) incentive to do it. Ensure there is a plan to use everything in the fridge and freezer. Watch sales to anticipate busy and slow days to know how much to order. It’s better to run out than throw out!

- **Have a plan for leftovers**
  
  Whether you turn leftovers into staff meals, tomorrow’s soup, or sell it marked down for quick sale ensure that leftovers are part of your planning.

Food Donation


- This Act protects donors from liability when they act in good faith to donate surplus perishable food, while ensuring recipients’ rights are protected.
- As long as the food was not rotten or unfit for consumption, and the food was not donated or distributed with reckless disregard for safety, this Act provides protection from liability.
- The Act encourages organizations to make donations of perishable food and provides a valuable source of nutrition to recipients.

In Canada, no reported court decision has ever imposed liability... for problems caused by donated food.

**BC Centre for Disease Control (2018)**

Lower Mainland Food Donation Organizations

- **FoodMesh**
  
  https://foodmesh.ca/
  
  - B2B marketplace that matches surplus food to a verified network of businesses and charities.
  - Self-serve platform.

- **Food Stash Foundation**
  
  https://www.foodstash.ca/
  
  - Rescue food otherwise destined for landfill, delivers food items to charities and food-insecure households in Vancouver.

- **Greater Vancouver Food Bank Food Runners**
  
  https://foodbank.bc.ca/our-programs/food-recovery/food-runners-faqs/
  
  - Pick up food donations that require refrigeration from Food Safe sources.
  - 10 lb minimum donation of food.

- **Quest Food Exchange**
  
  http://www.questoutreach.org/
  
  - Redistribution of quality surplus food, primarily through Not-For-Profit Grocery Market model.
  - Ex. Canned foods, non-perishables etc.

---

Appendix B

Interview Questions with SFU MECS and Sodexo
1) Can you walk me through the current MECS food waste process?
2) Where is the food stored and prepared?
3) How much time in advance do you know if there will be extra/wasted food?
4) Are you aware of the BC Food Donor Encouragement Act?

Appendix C

Interview Questions with Steve’s Poké Bar and Renaissance Coffee
1) What is the current progress in food waste tracking?
2) Have you noticed a volume of waste that you don’t know what to do with?
3) How much food waste do you create weekly?
4) Is it more pre (spoilage, meal prep) or post (unserved food, plate waste) food waste?
5) What are some barriers preventing you from donating food or are there opportunities to help?