UBC Social, Ecological Economic Development Studies (SEEDS) Student Reports

Exploring Ways to Lighten AMS Food and Beverage Department's Ecological Footprint

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Group 2: Eco-box reusable container initiative

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Abstract

Working to find ways to improve the AMS lighter footprint strategy, our group proposes the eco-box program to broaden our sustainability of food to not only about what we eat, but also about how we eat. Seeing the huge volumes of disposable food containers that make their way to the landfill everyday from the University of British Columbia, we researched alternative ways to reduce our impact on the biosphere. Adapting the concept from successful programs elsewhere, the eco-box program for UBC has great potential because it is the perfect timing to include needed infrastructure in the plan for the new Student Union Building. We consulted with our local stakeholders, representatives from AMS Food and Beverage Department and UBC Food Services to see their perspective on the project. In addition, we contacted the Metro Vancouver Sustainable Business Department and the Sustainability Office at the University of Toronto Scarborough for interviews about similar programs they have implemented. We found that there are multiple logistical challenges in implementation, including how to deal with hygienic issues, transportation and storage, cost agreements between UBC stakeholders, and getting buy in from students. After proposing some potential solutions, we conclude, however, that the program is feasible and urgently needed. We believe UBC can take a large step towards being a leader in sustainability with this campus-wide initiative.

Introduction:

There are signs of worrying biosphere degradation around the world. Global climate change, touted as the defining issue of our generation by some, is negatively impacting water, ecosystems, food production, coastlines, human health and species extinction, to name a few (Kim et. al, 2008). The severity of these impacts over the long term can be minimized if there are immediate changes made (by individuals, businesses, academic institutions, and governments) to reduce greenhouse gas emissions (Kim et. al, 2008). The University of British Columbia (UBC) pledges to become a leader in reducing our impact on the Earth. As part of that campaign, the Alma Mater Society's lighter footprint strategy states that their goal is to be "a leader in reducing the university campus's ecological footprint to sustainable levels by fostering environmental justice in our own operations and lobbying for sustainability practices through our relationships with the university community and broader society (AMS, 2008)."

In order to further that commitment, our group is helping to find ways to lighten the ecological footprint of food services at UBC. As part of the Faculty of Land and Food Systems, we recognize that the sustainability of food is broader than what we eat, it is also about how we eat it. Our scenario was originally designed to focus on modifying the ingredients of what we eat to more local, organic, and seasonal ingredients. However, our group agreed that it was equally as important to focus on improving the way in which we consume our food. Thus, we investigated into a campus wide "eco-box" reusable take-out container program. Our proposal should fit under three targets of the AMS Lighter Footprint Strategy: Food & Beverage (Internal), Materials (Internal), and Food & Beverage (Interactive).

This paper will be introducing our ideas for the eco-box program. It will discuss the environmental impacts of the current packaging and disposable waste used by AMS food outlets, investigate various materials for the eco-box and some of their advantages and disadvantages, and explain our proposed system from both a student and administrative perspective as well as potential problems of this program. Finally, our group will be making some recommendations for future projects for LFS 450 students and stakeholders to ensure the sustainability and the successful implementation of this program.

Vision Statement:

The overarching goal of a sustainable food system is to protect and enhance the diversity and quality of the ecosystem and to improve social equity, whereby:

1. Food is locally grown, produced and processed.
2. Waste must be recycled or composted locally
3. Food is ethnically diverse, affordable, safe and nutritious
4. Providers and educators promote awareness among consumers about cultivation, processing, ingredients and nutrition
5. Food brings people together and enhances community
6. Is produced by socially, ecologically conscious producers
7. Providers and growers pay and receive fair prices

A sustainable food system is one that provides enough healthy food to meet current food requirements while maintaining healthy ecosystems with little or no impact to the environment (APHA, 2010). For a food system to be sustainable, food must also be produced, distributed and consumed locally, as well as be available, accessible, affordable and safe (APHA, 2010). Keeping this definition in mind, we agree with the seven guiding principles of a sustainable food system defined in the Vision Statement which was collaboratively developed by the UBC Food Service Project Partners. However we think that before waste is to be recycled or composted locally, it should be minimized as much as possible, keeping in mind the ultimate goal of zero waste. Therefore, more effort should go towards waste minimization, and this should be an important guiding principle that should be added. We believe that any waste that is returned to the land must not have any negative impacts on it, and should ideally benefit and enhance the quality of the land.

Problem Definition:

Food production choices, as part of overall consumption trends, have greatly contributed to "negatively affecting the world's water and land resources, climate and increasing human conflict over these important resources (UBC FSP Scenarios, 2010).” Consequently, the senior undergraduate students of the Faculty of Land and Food Systems have been asked by the AMS representatives to help expand on the food system component of the AMS Lighter Footprint Strategy (UBC FSP Scenarios, 2010). A food system is defined as the production, processing, distribution, and consumption of food products, eventually resulting in outputs that are either discarded or recycled (Biological Control & Sustainable Horticultur, n.d.). Although our scenario is focused on the production and processing part of the food system, our group believes that it is necessary to improve all aspects of it because they are all interdependent (Biological Control &

Sustainable Horticulture). As a result, we have expanded our project to include the outputs component.

UBC generates over 12 tonnes of garbage a day, which is enough to fill 55 Volkswagon Beetles full of trash (Wastefree UBC, n.d.**).** This results in over 11,000 Beetles full of trash that UBC sends to the landfill annually (Wastefree UBC, n.d.). 40% of the waste produced at Food Service outlets is made up of disposable containers, such as coffee cups and paper plates (Wastefree UBC, n.d.). We believe that this is a large environmental price to pay for temporary convenience**.** The amount of disposable waste, as well as compostable containers being thrown into the trash, are some of the most important current issues of concern (Wastefree UBC, n.d.).

We are proposing an eco-box program that can be adopted by UBC food outlets throughout the campus to reduce the amount of waste that is generated due to packaging. Ideally, this program, initiated along with the new SUB, allows students to borrow reusable containers from the participating AMS and UBC food outlets upon the purchase of food items, thereby replacing the use of disposable take-out boxes. We believe that this is an ideal time to introduce such a program because the new SUB can be designed to incorporate our proposed ideas. Upon consulting with our stakeholders and project coordinator, our idea received positive feedback, and we believe that this system can serve as a model for other university campuses and businesses to follow.

Methodology

Our research consisted of three stages: scenario background research, case studies, and key informant interviews. First, we examined the online resources provided by the Land and Food Systems 450 course materials containing statistical and qualitative data for past food retailers. Next, we investigated various waste management case studies around the world to

determine the types of programs that could be applicable to UBC. Finally, we conducted interviews with five key informants: 1) Nancy Toogood, manager of AMS Food and Beverage Department, 2) Dorothy Yip, general manager of Retail Operation, Purchasing & Project Coordination Food Services, 3) Ayrin Ferguson, Manager of UBC Human Resources & Administration 4) The Sustainable Businesses Department of Metro Vancouver, and 5) the University of Toronto Scarborough Sustainability Office. With the utilization of these interviews and research, we were able to make decisions and recommendations for the eco-box system for the new SUB. In addition to these key informant interviews we researched into 12 different case studies. Details regarding each stage of our research methods are documented below.

Stage 1: To start, we examined the sustainability reports in the scenario 5 resources section on the Vista website to give us an overview of the definition of lowering an ecological footprint, as well as the related initiatives that UBC has participated in to achieve a lower ecological footprint. The scenario objectives focused on modifying recipes of food items in selected food outlets in the SUB to include local and seasonal ingredients. However, the AMS Lighter Footprint Strategy report indicates that one of their objectives is to reduce the amount of disposable materials used in AMS operations as well as to decrease the use of toxic materials in hopes of creating a more sustainable and environmentally friendly campus (AMS, 2008). In addition, these goals, as well as the large amount of waste generated at the UBC campus, have contributed to our desire to target waste reduction of the university's food service outlets.

Stage 2: Since this is a pilot project, we started our basic research through the Internet using search engines to find similar initiatives at other institutions, such as universities, food courts and other restaurants. The idea that caught our attention was the various reusable container programs. These boxes would not only reduce the use of disposable containers but also

decrease the demand of resources used to produce them due to long-term usability (McDaniel, 2009).

Stage 3: Upon proposing the eco-box system for the new SUB, several logistical situations of this program were discussed. Interview questions were prepared for each interviewee, specified to their professional roles. We decided to conduct interviews instead of surveys as interviews may provide more accurate results from professionals, while surveying would take too long and potentially lack adequate information, given the time frame for our project. The interviews that were conducted allowed us to gather qualitative data of the opinions and feedback from each of the representatives of the AMS Food and Beverage Department, UBC Food Services, the Sustainable Business Department of Metro Vancouver and the University of Toronto Scarborough Sustainability Office. These interviews helped us further assess the current situation and potential logistical issues with the implementation of the eco-box system.

Our main stakeholders and respondents at UBC are from the AMS Food and Beverage Department and UBC Food Services because they oversee most food retailers on UBC campus. Two face-to-face and one email interview with Nancy Toogood, Director of AMS Food and Beverage Department, was conducted. We were also able to have an interview with Dorothy Yip, manager of UBC Food Services and Ayrin Ferguson, Manager of UBC Human Resources & Administration. These two interviews are our main focus because the similarities and differences in their responses to our questions will help us to implement an eco-box system that is beneficial and fair to both parties. Our two other key informants were from other initiatives in Canada: one in Vancouver and one in Toronto. We were able to contact the Sustainable Businesses Department of Metro Vancouver, which is responsible for the implementation of sustainable systems to large-scale businesses, via email. In addition, we also emailed the

University of Toronto Scarborough Sustainability Office in regards to their campus eco-takeout container program.

Findings:

Internet research

The second stage of our research methodology involved an investigation of a variety of programs that can help to lighten the ecological footprint of the AMS. Below is a summary of the more interesting case studies we found that helped us to solidify the UBC eco-box program as well as see some other best practice options that UBC can adopt. We summarized these cases into categories of: variations on the eco-box program, raising awareness, recycling, reducing, and reusing.

Case Studies from of institutions of environmentally friendly food services:

Variations on the eco-box program

- Students check out a reusable container with their university ID. When students do not return their reusable plates, Dining Services will announce an "amnesty day" in which students can return their containers that have built up over the semester and the students will receive a reward such as a free side dish or a cookie (Brown & Eaton, n.d.).
- Students have the option of using a reusable container for $10 and exchange their used containers for a clean one or for a key chain (McDaniel, 2009).
- The Sustainable Dining Club at Dartmouth College involves one hundred forty students who participate in waste-free dining (Brown & Eaton, n.d.). They are given a kit including a reusable container, cloth napkin, silverware, a Nalgene water bottle, a coffee mug and a carabineer. The program justifies the cost of each $20 kit by citing that "since each student uses about $1.17 worth of disposables every day, one of these kits will pay for itself in seventeen days." Jim Merkel, the College Sustainability Coordinator, said, "Find a place in town where you can get a seventeen day return on your investment." As with other programs, students return the kit for washing by food services.

Raising Awareness

- Singapore Environment Council: Green Label Food Court Certification where food courts can be labeled eco-friendly (Singapore Environment Cousel, 2010).
- "Fresh Set of Eyes" program (similar to a secret shopper program): the evaluators assess each food service's recycling and other improvements (Notre Dame Food Services, 2008).

- All employees have environmental job expectations included in their performance reviews (Dining Services, n.d.).
- RecycleMania: competition for campuses in USA and Canada to compete for who recycles the most (Recycle Mania, 2010).
- Create a desirable and comfortable atmosphere that encourages dining in rather than carry out (Brown & Eaton, n.d.).
- Students erected a giant Pyramid of Waste — a stack of Styrofoam to-go containers — designed to encourage students to eat in (Curry, 2008).
- Focus on changing the habits of new students (Brown & Eaton, n.d.)
- Eco Reps program: students paid to conduct outreach activities (Brown & Eaton, n.d.).

Recycling:

- "Single stream" recycling: all recyclables can go in one container instead of being separated (Notre Dame Food Services, 2008).
- Recycable materials: aluminum foil, disposable aluminum pans (Notre Dame Food Services, 2008).
- Recycling at the football stadium on game days, because approximately 75% of what is sold through Concessions is recyclable (Notre Dame Food Services, 2008). For compost to be effective, compost bins must be put next to every landfill trash can (Notre Dame Food Services, 2008).

Reduce:

- Relocation of paper napkins to dining rooms cut consumption by 50% (Dining Services, n.d.).
- Cook to order and batch cooking reduces leftovers, micro filtration cuts the use of cooking oils in half, installing variable speed cooking exhaust hoods to reduce energy usage (Dining Services, n.d.).
- A wrapping station has also been created for carryout items (National Wildlife Federation, 2000).
- Serve more raw foods to decrease energy/water used in cooking (National Wildlife Federation, 2000)
- Students eat less and waste less food when they do not have a cafeteria tray in a buffet style cafeteria (Curry, 2008); A 20-50% reduction in food and beverage waste (Kuck, 2009)
- Suggestions: use eco-friendly chemical cleaners, bulk sugar and ketchup dispensers instead of disposable packets, install coolers for drinks rather than sell individual cans (Brown & Eaton, n.d.), and kitchen waste oil is filtered and reused before being donated to biodiesel-fuel depots (Curry, 2008).

Reuse:

- Offer a sink area in the Commons in for cleaning reusable mugs and containers (National Wildlife Federation, 2000)
- Offer pizza, deli sandwiches and grill items in reusable baskets (National Wildlife Federation, 2000).

Key Informant Interviews Summaries:

Below are the summaries of the responses obtained from the five key informant interviews we have conducted in relation to our eco-box program.

a) Nancy Toogood's email:

We emailed Nancy several questions regarding the current usage of disposable containers that is taking place in the SUB. Presently, the AMS is paying $0.022 for each take-out container, as UBC Food Services and the AMS were able to take advantage of volume discount. The biodegradable containers that are purchased hold 34 oz of food. However, a 30 oz size container may be introduced to accomodate smaller portions offered at restaurants, such as The Moon. Most outlets are busiest during lunch hours between 11am-2pm, while other restaurants such as Blue Chip, Bernoulli's and the Pendulum are busiest during the morning hours. Approximately an average of 8000 people walk through the SUB daily and a survey indicates that 80% of these people are looking for some type of refreshment: meals, snacks, coffee, beverages, etc. We were also informed that the current SUB does not have a central washing station for our eco-box program to be implemented successfully. However, there are plans to include such a facility in the new SUB that is to be built within the next few years.

b) Dorothy and Ayrin' interview:

Dorothy Yip, general manager of Retail Operation, Purchasing & Project Coordination Food Services, and Ayrin Ferguson, Manager of UBC Human Resources & Administration expressed some of their concerns and provided some recommendations upon hearing about our eco-box program, during our in-person interview. They were in favour of the idea of reusable containers, however certain logistical issues need to be considered before the launch of this new project. One issue of concern is hygiene. Students may leave leftover food in their container for

long periods of time before they return it, which may lead to cross contamination and endanger employee safety upon handling those containers.

Another concern involved is the allocation of costs between the AMS and UBC food service outlets as we are hoping to make the eco-box program available for every food outlet on the UBC campus. These costs include employees' wages, equipment, transportation cost, and redistribution. Moreover, current food outlets at UBC do not have excess storage area at their current retail location to store a large amount of containers. Many food outlets also do not have the standardized three-sinks for rinsing, washing, and sanitizing, nor do they have a commercial dish washer that is deemed safe for washing containers designed for public use. Therefore, storage and sanitation are key issues that need to be addressed before introducing the eco-box program throughout the UBC campus.

Solutions for lost containers, as well as the price that the department (AMS or UBC food service outlets) has to charge the students for lost containers are additional issues for investigation. Finally, the ecological impact on the environment as well as the economic impact of lost containers must be examined, and incentives for students to participate in this program must be determined.

c) Metro Vancouver email and interview summary:

The Metro Vancouver Sustainable Businesses Department also provided us with some potential logistical issues of a reusable container initiative. Container hygiene was also a key issue that was mentioned. It is crucial to have a central washing and sanitation station that is strictly regulated by food safe guildlines on industrial washing requirements (time, temperate, pre-soaking, air drying etc.), especially in order to gain the trust of customers regarding the hygienic conditions of the containers. We were also advised to adopt a deposit system to help ensure the return of borrowed containers. Transportability and durability are important factors

when deciding on a suitable container material. Plastic containers should be avoided unless we are strictly dealing with cold food items, as heating plastics can generate harmful toxins. The Metro Vancouver Sustainable Business department is currently working on reusable plates initiatives at festivals, as well as developing a cooperative system for reusable take out food containers at restaurants within a neighbourhood. Other businesses with similar initiatives of using reusable plates or containers include Curry to U on Graville Island and Oakville Place Shopping Centre.

d) University of Toronto Sustainability Office:

The eco-takeout container program follows a card system, where students purchase a card for $5.00 which they can exchange for a take out container upon the purchase of a meal. A card purchase comes with a 50 cent discount on the next ten meals purchased with a reusable container, reulting in a zero net cost for the student in the long run.

All dirty containers are washed by the main food court vendor of the University. Students return their used containers into a specific bin at the cash register in the food court and it will be collected by kitchen staff members throughout the day for washing.

This type of program is not one to generate profits to the food vendor, as purchasing disposable products will always be the cheapest option. However, it is a great environmental initiative that should be pursued.

Discussion

This section will be discussing the disadvantages of the current packaging system as well as the Eco-Box program and its advantages. We will also address certain logistical issues from both the student and staff perspectives, and provide some potential solutions to these issues.

Disadvantages of the current packaging system:

Nancy Toogood. has mentioned that the AMS and UBC Food Service outlets are currently using bio-degradable paper-based containers, styrofoam, and polyethylene containers (personal communication, February 10, 2010). Both styrofoam and polyethylene containers are usually non-degradable. After being transported to the landfill, the styrofoam and polyethylene containers will only break down into minute pieces (Jensen and McBay, 2009). These minute pieces can never be used as nutrients and resources for other organisms such as plants and small mammals because their chemical compositions are toxic and unable to be broken down by microorganisms (Jensen and McBay, 2009). The toxic chemicals penetrate through soil and contaminate ground water and further pollute plant roots and soil particles (Jensen and McBay, 2009).

Although the bio-degradable paper-based containers are decomposable, it seems that most students are not aware of this fact. The majority of students still throw away the bio-degradable containers into garbage bins, which made the switch from styrofoam and polyethylene containers meaningless in terms of waste reduction. The degraded bio-degradable container particles are reusable for other organisms; however, the energy required to produce the bio-degradable containers is far greater than that required to produce the non-degradable polyethylene containers (Jensen and McBay, 2009). If students throw away the bio-degradable containers along with non-degradable polyethylene containers, the negative environmental impact to the land is much larger than solely throwing non-degradable containers away. Nevertheless, by cutting down plastic usage in a year, a city with a population of 740,000 can save 1.5 million liters of oil, as well as an eliminated 4.2 million kilograms of carbon dioxide (Curran, 2007). Thus, with our proposed system of decreasing waste production at UBC, the negative environmental impact contributed from the campus will be greatly reduced.

The Eco-Box:

The launch of the eco-box system at UBC was inspired by Mills College. Their quest to find a sustainable, environmentally friendly alternative to disposable containers had led to the launch of the eco-box program. To initiate our own eco-box program at UBC, students will pay a small fee at the beginning of the year to gain access to a reusable eco-box. Students will then be registered into the computer system. The eco-box can then be used throughout the UBC campus, with the exception of first year residences where they have their own seperate container program. Upon using them, students can then bring in their dirty containers to designated drop off locations across campus and exchange them for a clean one. If a new box is not used at that given time, a placeholder card will be given to the student, which can be traded in again for a clean eco-box. This card gives students the option of not having the extra burden of carrying the containers around. This process can be repeated as many times as desired during the length of the school year.

Advantages of the Eco-Box Program:

One of the advantages of launching the eco-box system at UBC is that the waste from disposable containers will be dramatically minimized. With less input of garbage into the landfill, less toxic compounds will be produced. Also, with minimized waste going to the landfill, less harmful substances are polluting the ground water, soil, and microorganisms. Furthermore, with UBC demanding less take-out containers, less styrofoam or plastic containers are produced at the production line. When fewer containers are produced, the energy used for producing the containers decreases, leading to less greenhouse gas emissions. With the launch of the eco-box system at UBC, the waste production at the supply chain will certainly decrease dramatically. Since the "sin-tax" goes along with the eco-box system, students save a huge amount if they participate in the program. Moreover, joining the eco-box program not only

lowers the environmental impact caused from using disposable take-out boxes, but it also benefits students financially.

The large volume of student particpation in the eco-box program also means that the amount of garbage produced will decrease. This in turn leads to less cost associated with the disposal of garbage, for example loading the trash on trucks and driving it to the landfill. If the logistics can be figured out and agreed upon by all the stakeholders, this innovative initiative may also garner more attention and funding. Not only is the eco-box better for the environment, but this is also a great opportunity for UBC to take leadership and be the first institution in the Greater Vancouver area to come out with an exciting, sustainable program.

Potential Logistical Issues:

We realize that with the initial implementation of this program, logistical issues are inevitable. These may be from a student, staff, or storage perspective. This section discusses impending obstacles that students as well as staff may face using the eco-box program and possible solutions.

1) From a Student Perspective:

One common obstacle that students may face is misplacement of their placeholder cards or their eco-boxes. For a small fee, students can redeem a new placeholder card at the UBC carding office located inside the UBC Bookstore. The fee will encourage students to be more careful with their containers and to partly cover the cost of the damage to the environment by throwing away one reusable container into the landfill. This is assuming that all lost containers will end up in the landfill, and not recycled.

Determining the number of containers that must be provided to food outlets for the students can be solved by examining the number of take-out boxes that are currently being used on a daily basis in the in various food outlets within the SUB, especially during peak hours, as

well as the number of transactions a food outlet has per day. The number of students that enroll in the reusable container program can also be used to estimate a suitable number of containers that each food outlet should have.

Upon returning dirty containers to drop-off locations, students will have to scrape off remaining food inside the containers; otherwise staff will refuse to take it back. To prevent remaining food scraps from going into the landfill, we propose setting up compost bins next to each eco-box drop off location. This will, however, require daily maintenance from staff (ie. extra labour costs), so odours and flies will not be an issue.

Another issue that students may find that arise with this program is that student needs incentives to join the program. In order for this program to become a campus-wide initiative, previously disposable container needs to have an additional cost. For example, those who do not join the eco-box program will then be subjected to a “sin tax” when they purchase their food in a biodegradable box. The tax will be $1 per biodegradable box. This gives students who eat at the SUB often an incentive to join the program. In addition to the sin tax, raising awareness of the environmental and financial benefits gained through this program will encourage student enrolment and will be crucial in recruiting participants. We propose that this program should be advertised during the UBC first year orientations, Imagine UBC.

The cost to join the program is another area of concern from a students' perspective. We believe the price should cover the cost of the boxes as well as other costs for the program. The important thing here will be to ensure that the cost of joining the program is still more affordable for students than choosing to pay an extra dollar for the biodegradable boxes.

2) From a Staff Perspective:

a) Storage:

Storage space is an issue because a large amount of containers are needed to provide for the 47325 students enrolled at UBC (UBC, 2009). Given that the new SUB will be built several years from now, the storage space issue can still be negotiated. However, according to Dorothy, some UBC Food Service retails may not have a huge storage space for these containers, such as Ike's Café. (Yip, D. Personal communication, March 3rd 2010). To counter such problem, we propose stackable containers due to its space saving properties (Lin, 2010). We recommend a storage room for all cleaned and sanitized containers, which will be distributed whenever containers are demanded. Each retailer will have 3 hours worth of containers based on their daily record of food sold. Retail employees should be aware of the amount of boxes they have in order to provide enough containers during 11am and 2pm (Toogood, N. Personal communication, March, 17,2010). Based on our observations, line ups are largely reduced after the lunch rush hours. Therefore, it is also possible to deliver more containers during that time to replenish low levels of containers so operational efficiency will not decline. To solve the storage space issue for Ike's (Irving library) and Reboot (ICICS) cafes, we could rent a room in those two buildings for storage. These containers shall be transported from the central location in the new SUB by their own employees to reduce the cost and energy. The disadvantage of this is that it is very difficult to predict the amount of boxes required for the next three hours and that there will be an increase in cost for a new management team, and additional cost for employees who will be delivering the containers.

b) Hygiene and Cross Contamination:

One of the biggest concerns from UBC Food Services was that there can be a lot of hygienic issues, including students leaving food in the box for an extended period of time and

then bringing it back to be washed. We looked into the Canadian food safety guidelines for such a program to see what kind of clean up procedure would be needed for the eco-boxes.

Unfortunately, it was extremely hard to find any direct regulation that applies to our case, especially about what to do with containers that are returned a long period of time after it was used. A potential organization to contact to ask about our case is the "Restaurant Regulations made easy in British Columbia" website, http://www.restaurantregulations.ca/home, which is set up by the BC Restaurant and Foodservices Association, in partnership with the Province of BC.

We also found an interesting case study of the illegality of using reusable containers at food carts in Portland, USA (Cuisine Bonne Femme, 2010). The Federal Department of Agriculture tipulates that "getting food from a food cart with your own reusable container is against health regulations" according to this blog post (Cuisine Bonne Femme, 2010). The reasoning behind the law is that cross contamination can be dangerous. For example, if a customer comes with their own box which is contaminated with a deadly bacteria, then the utensil used to put food into the box can come in contact with that bacteria and spread it to the food of other customers.

Interestingly, UBC Food Services already allows people to bring their own reusable containers, in fact, they sell such containers at various outlets. Therefore, it seems like there can be some compromises made to the benefit of the eco-box program. Three suggestions we have are that firstly, students participating in the eco-box program must get a box that is centrally washed at the new SUB with a commercial dishwasher. They cannot bring back an eco-box that they have washed themselves. If they do, they can simply exchange it for a new one from the place they are buying food. Secondly, staff in charge to taking in the dirty containers have the right to refuse a container if it is unhygienic. Students will need to dispose of the remaining food

and rinse it before returning the eco-box. Lastly, we recommend using stainless steel boxes because they are more hygienic, durable and can be cleaned easier than plastic ones.

c) Possibility of long line-ups:

At the various drop-off locations, there should be another line for dropping off containers only. Students would not want to wait in the same line as other students ordering food, especially during the peak hours. To make the line-ups as efficient as possible, we are suggesting the drop-off locations to accommodate an extra line for dropping off eco-boxes only. Also, as the program grows organically, more places for drop off can be added as needed. At this stage, it is impossible to predict where demand would concentrate.

d) Box Drop-Off/Return Locations:

When customers return their dirty containers, they will receive a placeholder card that allows them to receive their food in a clean container. However, given the amount of people who visit these food retailers, the number of unclean containers will pile up. There are many food retailers around UBC, some have enough storage space and are capable of becoming a drop off location for dirty eco-boxes, however, small cafes like Ike's and Reboot do not have this capacity. To mitigate this problem, students can always return the used eco-box to the new SUB. There are many UBC food service outlets at various locations, but their operating hours vary between each food outlet. For example, Blue Chip Cookies located at the SUB open very early in the morning, and Tim Horton's located at the forestry building close later in the evening.

Tim Horton's is chosen as one of the drop-off locations because it has long operating hours, and students who have late classes near that area can drop off their dirty eco-boxes at their convenience. The new SUB is chosen as the central drop-off location because it is

situated conveniently and many students go by the SUB on a daily basis. As a result, we think that the new SUB will be the ideal drop-off location.

In regards to collecting the dirty eco-boxes for cleaning, cleaning employees will transport them from Tim Horton's to the new SUB where a central washing and sanitation station that is regulated by food safe guidelines will be set up. During each morning, eco-box containers will be delivered and distributed by the cleaning staff. A trolley will be used to distribute containers to food outlets that are located within the SUB and a small truck will be used to deliver containers to food outlets that are outside the SUB.

e) Splitting of the Maintenance Costs

This program requires the cooperation between AMS and UBC Food Services in order for this campus wide initiative to be a success. According to Nancy, maintenance costs will have to be negotiated between these two departments, as they are two separate entities (Personal Communications March 17th, 2010). Our suggested solution is to split the costs based on the number of containers used by these two departments. At the end of each day, the remaining boxes will be counted by the management team to calculate the number of containers used. The sum of these numbers will measure the proportion of the maintenance fee they have to pay. In addition to that, if trucks are used to transport boxes to food retails outside the SUB, the transportation costs will be split between them and the amount will be based on the number of boxes used as well. However, the disadvantage of this system is that it may get very complicated and may be still unfair to some retails..Also, professional accountants and employees will be hired which will increase the cost.

f) Eco-Box Material:

As seen in our findings, some of the major concerns about the boxes used for this program included fear of cross contamination, cost effectiveness, hygiene of students not returning the boxes on time, and the long term durability of the boxes. Hence, our group, after discussion, concluded that the material chosen for the eco-box would ideally suit the following characteristics:

1. health safety approved by Canadian government agencies
2. affordable
3. non-leaking
4. washable using commercial dishwashers
5. durable
6. lightweight
7. environmentally sustainable
8. easy storage and transportation
9. microwavable

Unfortunately, there are not many options. Our group looked into three different options: plastic, stainless steel, and wood. In addition to a general analysis for the different materials, we also chose one specific product that is ready to be purchased to explore the suitability. This included a collapsible box for plastic, tiffins for stainless steel, and bento boxes for wood. The results from our discussion, according to our general opinions, are presented in table format and the specific case studies include more detailed information.

Ranking/Grading

	Plastic	Stainless Steel	Wood
Health and sanitation	2	1	3
Affordability	1	2	3
Leakage/Transportability	1	1	3
Washability	2	1	3
Durability	2	1	3
Lightweight	1	1	1
Environmentally sustainable	3	2	1
Easy Storage and transportation	1	1	2

Microwavable	1	3	3
	14 (#1)	15 (#2)	22 (#3)

The reason why plastic ranks higher than stainless steel is most because of cost and the fact that it is not microwave safe. Since we can get orders in bulk and that student would rarely microwave food they have just bought, our group believes stainless steel containers are better than plastic in most aspects. More of the advantages and disadvantages are discussed below.

Plastic:

Major advantages: plastics are cheap, light weight, and durable. As the most commonly used reusable containers, there are many suppliers who offer products of different styles and prices.

Major disadvantages: there are many confusing health claims about different kinds of plastics. Most plastics have not been proven to be one hundred percent carcinogen free. A big decision has to be made about whether a large scale program such as the eco-box should make an investment of boxes that can turn out to be harmful later on. Also, plastics are the most unsustainable of these three materials. In general, plastics used for making lunch boxes cannot be recycled at the end of usage and will end up in the landfill. As explained in our introduction, the reason why we are proposing this program is because of the appalling effects plastic has had on the environment.

Plastics are separated into several types of categories. The commonly recycled plastics are polyethylene terephthalate (PET) and high density polyethylene (HDPE) (Kim, 2010). Apart from these two types, others such as low density polyethylene (LDPE) that makes plastic bags, polypropylene (PP) for chip bags and polystyrene (EPS) are less frequently recycled (Kim, 2010). Recycling plastic is a more effective way of reducing waste to avoid accumulation of waste in landfills. Although plastic packages are labeled with different symbols for different

types of plastics in order for consumers to identify more accurately, consumers are still unaware of this (Stein, 2008). As a result, it increases the difficulties to achieve high purity in the final recycled products (Stein, 2008). From our observation at the SUB, we see most students throw their finished foods including the packaging and decomposable utensils into the garbage. Once in the garbage, they will be trucked to landfill sites. This is a problem as Kim mentioned, it requires 20 years to decompose a plastic bag and 250 years for a plastic cup determined by its material and thickness (2010). For example, when polystyrene are contaminated by other materials such as water or food, it will be near impossible to be recycled (Styromelt, 2007).

Stainless steel:

Major advantages: In addition to being relatively lightweight and more durable, stainless steel is the most hygienic of all the materials.

Major disadvantages: unfortunately, stainless steel is more expensive than plastic and cannot be microwaved. It is also heavier than plastic, which makes transportation and storage a bit more problematic. The material itself has to be mined from the ground and may have a bigger impact than plastic, depending on how the mining was conducted. However, stainless steel can be recycled easily.

Wood:

Major advantages: The material is the most environmentally friendly among the options. Major disadvantages: wooden lunch boxes are not very popular and an extended internet search still resulted in very few suppliers available. Price is much higher than plastic or stainless steel and the durability of the box is questionable. In general, wooden boxes are not suited for commercial washing and microwaving.

Case Studies of different boxes

a) Plastic collapsible lunchbox made from PVC free plastic.

This food container is currently sold at UBC Food Services outlets for $6.00 (RubberMaid brand; there is also one from Tupperware called "Flat Out" (http://www.tupperware.com)). The container can collapse from a full sized one to one inch thick to reduce storage space. When we looked at the containers sold, the Rubbermaid one is made from #7 (Other: Usually polycarbonate, used in most plastic baby bottles, 5-gallon water bottles, "sport" water bottles, metal food can liners, clear plastic "sippy" cups and some clear plastic cutlery. New bio-based plastics may also be labeled #7) plastic. The Tupperware one is made from #4 (LDLDPE: Low density polyethylene, used in grocery store bags, most plastic wraps and some bottles) and #5 (PP: Polypropylene, used in most deli soup, syrup and yogurt containers, straws and other clouded plastic containers, including baby bottles) plastic. None of the plastics contain PVC, but they do use small amounts of BPA. It is however affordable.

b) Stainless steel tiffins, a traditional Indian reusable lunch bowl

This container, from http://www.happytiffin.com/lunch-bowls.html, is made from "high quality, food grade" stainless steel and is more durable than a plastic or wooden box. It is also BPA free, easier to clean, and safe for dishwashers. However, although the stainless steel is recyclable at the end, the environmental and social impacts of the extraction process is not clear. The tiffins are air-tight and water-tight and light weight (The 37 oz version weighs only 0.7 pounds). The drawbacks are that it cannot be microwaved and it is much more expensive than the plastic boxes ($17.50 retail price of the 37 oz version compared to $6.00 for the plastic). This may also cause more students to be tempted to take them home rather than return it to the

program.

c) Wooden bento box, a traditional Japanese lunch box.

There are many varieties of bento boxes (which basically means convenient meal box), although most are plastic nowadays. As wooden bento boxes are viewed as more of a luxury item, they are usually very expensive and made from high quality wood. This box, http://casabento.com/cart/index.php?main_page=product_info&cPath=1_18&products_id=204, is microwave safe and dishwasher safe (except the lid), but is worth approx. $30.00 retail price. They are probably less durable than plastic or stainless steel boxes and don't have as good ability to retain liquids. There are also bamboo lunch boxes, http://www.alibaba.com/product-gs/223128588/bamboo_lunch_box.htm. Although the price is lowest of all three ($1 to $5), the manufacture is unheard of and no further details are provided.

Recommendations:

The current eco-box system we are proposing will come in one standardized container size. Since portion sizes are different at each food outlet, we suggest that future LFS 450 students investigate different container sizes to make this program more suitable and applicable for both students and food outlets on UBC campus. Another topic that future students can look into is different types of containers that would be more appropriate for hot and cold foods. Another suggestion for Future LFS 450 students is promoting the eco-box program so that it becomes a campus wide initiative. The program is designed to decrease the garbage production of the current packaging system at the food outlets at UBC. This program will only be successful if students participate. Therefore, students' awareness of our goal to sustain and knowledge of how this program decreases the carbon footprint produced by UBC is extremely important in encouraging students to participate in the eco-box system. Future LFS 450 students may build a

large pyramid that consist of the amount of styrofoam boxes each person uses per year to illustrate to the public how much resources they will save by joining the program.

One suggestion in creating awareness on how to decrease our carbon footprint is to introduce this concept to first year students during orientation at UBC Imagine. A potential project for future LFS 450 students may include designing posters to educate first year students on minimizing their ecological footprints, including introducing them the environmental and financial benefits of the eco-box program.

Moreover, first year students are not the sole participants in this program.The program can only be successful only when all students (not just first year students), staff, and visitors participate in this eco-box program. Therefore, future LFS 450 students need to increase awareness of the importance of sustainability across the UBC campus so that all students understand the motive behind the "eco-box" program and further encourage participation.

We also recommend that our stakeholders, UBC Food Services and AMS Food and Beverage Department discuss the logistics of how maintenance cost will be divided amongst them. Both parties will need to negotiate a fair price for the program that will cover the cost of purchasing the containers as well as associated costs that are related to the program. While environmental and social sustainability are important, financial stability and cost recovery are crucial factors in sustaining this program in the long run.

Conclusion:

By introducing the eco-box system, we hope to move UBC towards becoming a more sustainable university by alleviating our current waste production. UBC is a large institutuon and becuase of this our efforts to make positive changes in reducing current packaging and disposable waste will have a significant impact in decreasing the university’s ecological

footprint. We are striving to reduce unnecessary waste going into the landfill and this is one small step in achieving the ultimate goal of zero waste production.

As one of the first institutions in the Greater Vancouver area to propose an implementation of the eco-box program, we are striving to be a model for other universities and businesses to join us in making more responsible and informative decisions with regards to our everyday choices. While our initial proposition has received positive feedback from our stakeholders, additional research is required to make this proposal a successful reality. We hope future students and stakeholders will continue with this project by incorporating our suggested ideas and make this eco-box program a campus wide initiative.

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