

UBC Social Ecological Economic Development Studies (SEEDS) Student Report

**Working Towards Sustainable Waste Management: A Plan for the AMS Food and  
Beverage Department**

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**AGSC 450**

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Faculty of Land and Food Systems  
Grounded in Science | Global in Scope

**Working Towards Sustainable Waste**  
**Management:**  
**A Plan for the AMS Food and Beverage Department**



**AGSC 450**  
**Scenario 2, Group 18**

April 11<sup>th</sup> 2008

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## Abstract

This research, part of the UBC Food Systems Project, has been based in part on the food procurement targets of the "AMS Lighter Footprint Strategy". We focused on the waste management aspect of food procurement at AMS outlets in the UBC Student Union Building. The integration of stakeholders in the university community along with research of past AGSC 450 papers and an intensive literature review enabled us to understand the current state of waste management at UBC, the success of previous programs, and future possibilities. Currently, awareness about sustainable waste management is minimal at UBC. Furthermore, university funding to implement these types of programs is limited. A number of issues have been identified such as, lack of staff to maintain compost bins and inadequate composting stations throughout campus. Thus, our goal is to increase awareness surrounding existing composting and recycling programs with initiatives such as road signs (to the nearest compost container), harmonization of signs throughout campus including the collaborative efforts of UBC Food Services and the AMS, and increasing the use of reusable containers. In the future, our recommendations (amongst others) are for AGSC 450 students to search for methods of funding for new compost bins in the SUB and the development and creation of a logo that would be placed on all compostable products. Furthermore, reusable containers should be sold in the SUB to reduce the use of disposable containers. Because there is minimal focus on waste management at other universities, UBC has the potential to become a leader in this capacity. The students of AGSC 450, staff and faculty, have the ability to bring this program to new heights with further trial and research.

## Introduction

The UBC Food Systems Project (UBCFSP) is a collaborative effort between partners, stakeholders and students working together on various sustainability driven assessments that focus on campus food systems throughout the University of British Columbia (UBC). Creating a program for campus food provision from the UBC Farm, developing a sustainable food outlet and examining the ecological footprint of the UBC campus are all examples of the avenues students and partners researched this term. During this capstone course of the Land, Food and Community series, students analyzed their scenario with an interactive and interdisciplinary approach. Each year, a new set of students investigate a topic by examining past UBCFSP reports, discussing present situations with current stakeholders and imagining future solutions and goals. By doing this, students create a vision of the "'desired future situation,' or what may eventually happen, but would never happen if we had not dared to go to the wild Utopian ideal" (Rojas et al. 2007).

This report commences with a description of the problem statement to which our group was assigned; creating sustainable food procurement targets for the "AMS Lighter Footprint Strategy" (AMSLFS). The Alma Mater Society (AMS) businesses involved include Blue Chip Cookies, Bernoulli's Bagels, The Gallery, The Honour Roll, The Pit Pub and Burger Bar, The Pendulum, The Moon and Pie R Squared. In the problem definition section, we will discuss our contextual insights regarding the assimilation of our scenario into the community, national and global food systems. We then analyze the UBCFSP vision statement and provide the necessary changes required to reflect our group values. The next section identifies our subsystem where we discuss our focus on waste management. The methodology section describes how through Community Based Action Research (CBAR) we developed a survey, met with stakeholders and researched past students work. This led us to one of the final sections of our paper, the findings. This section allowed us to assess the present waste management situation at UBC and thus we were able to develop recommendations for our

"future desired situation" at AMS outlets. These recommendations contain specific short term and general long-term recommendations. They are comprised of internal targets within the AMS, interactive targets between other subsystems, and finally suggestions for our colleagues and successors of the UBCFSP.

## Problem Definition

There is a growing campus sustainability movement worldwide. Such movements include better waste management, environmentally friendly building design, energy conservation, and increasing local food procurement. UBC's student society, the AMS, which represents over 45,000 students, centres on "improv[ing] the quality of the educational, social, and personal lives of the students of UBC" (AMS, 2007). Over the years, the AMS has taken up many sustainable initiatives such as the U-pass program, composting stations, low-impact building renovations, and sustainable food and beverage initiatives. In addition, the AMS Food and Beverage Department (AMSFBD) provides organic, shade grown coffee, discounts for reusable containers, encourages composting and supports the purchase of UBC Farm produce (AMS, 2007). Although there have been many efforts to promote sustainability on campus, the absence of a concrete strategy has resulted in limited outcomes. Staff and volunteer burnout, staff discontinuity, and lack of funding are some of the factors leading to inconsistencies and impeded progress in reaching improved campus sustainability. It is believed that with an effective sustainability policy in place, important ecological issues can be addressed in a more productive manner (Doherty, 2008).

Early in 2007, the AMS council with an objective to reduce the campus's Ecological Footprint passed the AMSLFS. Students in the AGSC 450 class were asked to help develop targets and action plans through the AMSLFS and within the food system constituent in order to reach this objective. The university can serve as a microcosm for change required to decrease the world's ecological footprint. As a result of the AMS following the plans and recommendations of the Lighter Footprint Strategy,

UBC will set an example for other organizations, universities, cities, and countries to follow.

Therefore, it is important that we work diligently in developing action plans along with stakeholders that lead to successful outcomes and ultimately towards sustainability.

## Vision Statement

As a group we agree, for the most part, with the vision statement guidelines provided by our project partners, as they are all important and connected. According to our value assumptions, these guidelines fall in line with the ecologically integrated paradigm where the preservation of ecological diversity and health are important. This paradigm emphasizes the diversity of ecosystems that are based on scientific biological principals such as looking at the food system with a holistic approach and taking into consideration animals, people and nature. Based on this paradigm, we felt that there were some areas within the vision statement, which needed improvement. For example, the first point discusses locally grown, produced and processed food choices. However, not all foods can be locally grown. We feel that part of the vision statement should incorporate appropriate guidelines for foods that can not be obtained locally. A suggestion would be to acquire foods from the nearest provider, which would reduce the carbon footprint. It is important to maintain a large selection of foods in order to be culturally diverse and food secure. In the third guideline, the term 'safe' should be defined and further elaborated. We feel that 'safe' should be defined as foods free of chemicals, biological hazards and treatments that pose danger to the environment, animals and consumers. We also feel that there should be a guideline that considers the accessibility of food on campus. AMS food outlets are concentrated in the SUB and we believe that there should be more food outlets dispersed throughout campus. With these suggestions we feel that the guidelines could be more concise. The following is how we would like to see the guidelines re-written:

1. Food is grown, produced and processed locally when available, and, if not, the closest provider should be used without excluding a variety of ethnically diverse choices.

3. Food is ethnically diverse, affordable, nutritious and safe and thus grown without the use of chemicals and practices which are or may be detrimental to the environment, animals and people, both now and in the future.

## The Subsystem

The subsystem that will be the focus of this research paper is waste management and reduction in the AMS Food and Beverage Department (AMSFBD) outlets. Reducing the amount of land-filled waste is a key factor in reducing the University's ecological footprint. There are many components that contribute to a sustainable food system; energy consumption, and food procurement of local and organic foods are two very important ones. Few people, however, go on to consider what happens after the 'farm to fork' segment; the food chain does not end here. When populations create substantial amounts of waste they require more land to absorb that excess waste, which then contributes to a larger ecological footprint. By just recycling one aluminum can, enough energy will be saved to run a television for 3 hours (Engineering Services, 2008). Proper waste management can reduce the amount of energy used, which thus decreases the footprint. A sustainable food system needs to incorporate reducing, recycling, re-using, and composting in order to become waste-free.

Attempting to reduce a country's ecological footprint can be difficult due to the country's size, existing policies, and the unwillingness of the population to change their habits. Colleges and universities can act as microcosms for change throughout the world. Universities often have large populations, large amounts of land, funds, an endless supply of imagination, hope and ingenuity, and the ability to change policies in a shorter amount of time (M'Gonigle & Starke, 2006). If a university is successfully able to create a sustainable food system or drastically reduce its ecological footprint then cities or countries could use the university's actions and policies as a blueprint for larger change.

The choice to focus on waste management and reduction to help achieve the AMS's goal of a lighter footprint was based on stakeholder input, ecological footprint analysis, the image of the AMS,



and emphasis from past AGSC 450 papers. In a meeting with Nancy Toogood, the Food and Beverage Manager of the AMSFBD, she requested that a marketing plan be created to promote the composting and recycling programs that already exist in the SUB. Promotion and awareness would be more valuable than "reinventing the wheel" (Toogood, 2008). She is one of the main stakeholders in the UBCFSP and her acceptance and interest ensures that this topic will be valuable. Research was also completed on the various components that contribute towards an increased ecological footprint and waste was one of the great contributors. In fact, looking at the ecological footprint done on the Pendulum, waste is the second largest contributor to an increased footprint after food production (Baynham & Dalton, 2005). Each system (country, university, population, etc.) must be able to absorb the total amount of waste that is produced without using another system's resources (Global Footprint Network, 2006). An added bonus to increasing waste management at the AMS is their image improvement. When a community or an organization publicly commits to reducing their waste, it promotes the image of sustainability. Therefore, students who are concerned about sustainability will be more apt to make purchases from the AMS than anywhere else. For example, students are highly concerned about the use of Styrofoam in the SUB. Promoting the use of compostable cups at Blue Chip Cookies is addressing the students concerns (M. Stein, personal communication, April 1st, 2008). Effectively managing and reducing waste at the AMS and across UBC will contribute to a smaller ecological footprint and improve the overall sustainability of the university.

Making changes to the way a university manages its food system waste may not seem like a substantial contribution towards overall ecological footprint reduction but, as previously noted, universities are microcosms for change and it's possible that these new policies could spread to national or even international waste management systems. Commencing waste reduction globally is essential; determining the best strategies to achieve this is occurring at many universities and UBC needs to be one of them.

## Methodology

The UBC Food Systems Project defines Community Based Action Research (CBAR) as an "inquiry or investigation that provides people with the means to take systematic action to resolve specific problems" (Rojas et al., 2007). CBAR views everyone involved as active participants and does not separate those involved into roles of "researcher", "participant", or "subject". Using this method of research is essential in this type of project because it involves and affects the entire UBC community. CBAR is a democratic, equitable, and life-enhancing method of research, and it is these characteristics that make CBAR a favourable technique in this project (Stringer, 2004). CBAR promotes relationships, communication and participation as the most effective ways to research a subject, and we took these principles into consideration when doing this project. By incorporating CBAR into all of our methods we were able to come up with more effective and efficient strategies to reduce waste problems associated with food at the AMS and thus UBC.

The goal of our research was to determine the best ways to reduce waste at the AMS Food and Beverage Outlets, primarily through encouraging composting, reusable containers and spreading awareness of current waste initiatives. To achieve this goal we started out by reviewing existing literature on the Ecological Footprint, the AMS Lighter Footprint and the work of past AGSC 450 groups. From this research we were able to narrow down our topic from reducing the AMS's ecological footprint to waste management and reduction in the AMS. We then researched the general waste programs of all the related stakeholders: AMS, UBC Waste Management, and UBC Food Services. We set up interviews with these stakeholders to obtain their input and to determine what they would like to see come out of this project. It was because of these interviews that we were able to refine our topic to composting, reusable containers, and awareness. Research was also done on other universities allowing us to see what their sustainability programs entailed.

Once we had determined the focus of our project we created a survey to be administered in the

SUB at lunchtime. The goal of this survey was to determine the overall interest in reusable containers. We needed to find out what percentage of people currently bring their own containers to school, if there was willingness to purchase reusable containers from the AMS, and what additional factors would encourage people to carry a reusable container. The numerical results were put into an excel file and statistical correlations were found. We were able to use these results and findings as evidence for some of our recommendations.

### Meetings with Stakeholders

Nancy Toogood: March 19th, 2008 at 2:00pm, two group members met with Nancy Toogood, manager of AMSFBD department. This was a prearranged meeting with all interested AGSC 450 students in the Student Union Building room 215. The information acquired from the meeting was then summarized and discussed with the rest of the group members. April 1st, 2008 at 10:30am, two group members had a personal meeting to elaborate on previous correspondence that was done by e-mail. This meeting was also summarized and posted for the other group members on the WebCT discussion board.

Miriam Stein: On April 1, 2008 at 9:00am, two of our group members met with Miriam Stein, the sustainability strategy coordinator for the AMS, in Agora Café. This meeting was arranged to specifically discuss the current waste issues involving the AMSFBD. The findings were placed on WebCT discussion board for the other group members to review.

Josie Midha: On April 1, 2008 11:30am two of our group members had a meeting with Josie Midha, manager of Café Perugia to discuss the composting project that was presented by previous AGSC 450 colleagues. She informed us that the program is working very well and that there are more compostable products placed in the compost bin than in the garbage (J. Midha, Personal Communication, April 1, 2008).

Kishani Gibbons: On April 1, 2008 1:00pm one of our group members met with Kishani Gibbons, the AMS Proctor, to investigate the possibility of putting stickers on the garbage cans and increasing the

number of compost bins.

Dorothy Yip: On April 2, 2008 11:00am, one of the group members had a telephone conversation with Dorothy Yip, of UBC Food Services, to discuss the current biodegradable containers that are being used at the UBC Food Service outlets along with the compost bins that they have incorporated into their system. An overview of the discussion was conveyed to the rest of the group members.

Nick Gallant: Several attempts were made to contact Nick Gallant at UBC Waste Management; however, they were not successful in achieving any communication.

### Survey

On March 19, 2008 at 12:00 pm (to ensure the greatest number of completed surveys) two group members administered surveys on a randomized basis in the eating area of Pacific Spirit Place located in the SUB. Consent forms provided by the AGSC 450 teaching team were signed by all respondents prior to the completion of the survey to enable the use of the provided data in our research paper. Faculty, students and campus visitors completed the surveys. The purpose of the survey was to determine whether the UBC population would like to see reusable, collapsible containers made available to them by the AMS in order to decrease the present waste problem caused by non-reusable containers. The survey was created with basic questions regarding, gender, age, faculty, and the use of reusable containers. There were a total of 49 completed surveys and consent forms (Appendix 1). The data was then collected and analyzed to determine any correlation.

Trade Show: On March 29th, 2008, one of the group members attended an environmental trade show at the Bill Copeland Centre in Burnaby, BC. She came across a table displaying wooden disposable utensils, and later contacted the manufacturer via e-mail to obtain further information and request a sample.

# Findings/Results/Discussion

## What is the Ecological Footprint?

The Ecological Footprint is a tool used to measure and manage resources. Essentially, one's ecological footprint is the amount of land and water area that the system (individual, business, country etc.) requires to produce the resources that it consumes and to absorb the wastes it produces. Since the world is a closed system the whole world cannot consume more than the world has to offer or renew (Moriyama et al.). (M'Gonigle & Starke, 2006). The ecological footprint takes into account four several consumption categories: food, transportation, consumer goods and services, housing/facility, and materials and waste (Baynham & Dalton, 2005). Within these categories are numerous subcategories that include a footprint multiplier depending on the energy used, including nuclear power as well as fossil fuels, along with land use, including, arable, pasture and sea (Baynham & Dalton, 2005). These footprint results are not only beneficial to the individual but it can be used on a grander scale to determine the greatest footprint contributors in a university, city, country and the world.

## What Other Universities Are Doing

Concordia University in Montreal has a number of initiatives that are aimed at decreasing the ecological footprint of their food system. Lug a Mug is a program that encourages students to carry a reusable mug with them (Concordia University, 2008). Students can also purchase a five-dollar reusable mug that is made locally from 100% post-consumer materials that is recyclable. One dollar from the price of the mug goes towards the campus-composting project. There is a ten-cent discount on beverages if the student uses their reusable mug. Students are also encouraged to reuse glass and plastic bottles, yogurt containers, Tupperware, etc. Concordia also has a composting program that accepts organic materials such as meat, as well as paper products. The R4 compost program encompasses ideas such as rethink, reduce, reuse, recycle and compost. This encourages the students

and campus to continually evolve towards sustainability. The "reuse" idea is extended to a free dish rental program that rents out reusable, washable dishes to student groups and community members for use during events or conferences. The user pays a five percent deposit that is reimbursed when the dishes are cleaned and returned. This program has diverted 13,000 plates and 500 mugs from the landfill (Concordia University, 2008).

Yale University is another leader in sustainability initiatives. Yale currently has its own farm, which plays an important role in connecting students and staff with the food system. The Yale Sustainable Food Project (YSFP) was developed, and "aims to nourish a culture in which the interwoven pleasures of growing, cooking, and sharing food become an integral part of each student's experience at Yale." This program also involves education about food in the classroom and in student life. Furthermore, Yale has started a program that encourages events on campus to be more sustainable. One initiative is establishing a sustainable menu, which can be provided by the university catering company. In order to measure these acts of sustainability, Yale has created a baseline metrics program where the data collected will enable them to understand their current state of the campus and benchmark their progress. They "will be able to monitor and learn from progress to date to make further improvements in the future" (Yale Office of Sustainability, 2008). Yale has also developed an Environmental sustainability index that "measures the abilities of nations to protect the environment over the next several decades" (Esty et.al, 2005). It does so by "tracking natural resource endowments, past and present pollution levels, environmental management efforts and the capacity of a society to improve its environmental performance" (Esty et.al, 2005).

University of California at Santa Barbara (UCSB) is a university well known for its sustainability efforts. The 6th annual sustainability conference was held in 2007 and attendees discussed methods to reduce food waste and energy use, steps to take towards sustainable food purchasing and distribution and achieving green dining certification. UCSB is committed to having a sustainable campus food system, which will include, "clear guidelines that prioritize local, organic,

humane, and socially responsible purchasing as well as waste reduction and green dining facility standards” (CASFS, 2007).

During the fall of 2006, Dartmouth College created a trial waste-free dining program in the dining halls. This program sought to replace disposable tableware with reusable ones, switch to bulk containers from packaged foods, recycle any packaged items that had no alternative packaging, and compost all food waste. The dining halls also offer healthier menus, organic and local food. Eliminating the waste produced in dining halls will significantly reduce Dartmouth’s ecological footprint and make the school more sustainable. They also established a Sustainable Dining Club that comes with a free kit including a, “leak-proof Nalgene bottle, an Eco-mug, a cloth napkin, silverware, a carabineer and a washable takeout container”. These kits can be used throughout campus (Dartmouth News, 2006).

Initiatives at the University of Victoria (UVIC) are centered on the types of food and procurement. The University of Victoria Sustainability Project (UVSP) has programs such as FUN, the Food University Network that creates a farmers market offering organic and local in season produce. The UVSP also offers cooking classes and workshops that focus on creating meals from local, organic and nutritional sources (UVSP, 2007). Food establishments at UVIC strive to sell only 100% fair trade organic coffees, and many establishments offer vegetarian and vegan options. The International Grill and the Health Food Bar are working to increase the amount of local food meals sold, and they each offer at least one menu item each day that is made from all local materials. Students are educated about sustainable horticulture through the use of a campus community garden and are allowed to grow food on their own garden plot (UVIC, 2008).

Simon Fraser University (SFU) started the SFU Local Food Project to reduce their food impact on the environment. The goals of the project are to increase local food on campus, raise awareness on the benefits of eating local food, and to support food production and distribution projects on campus. Accomplishments of the project include creating the University Local Food Toolkit, the SFU Local

Food Guide, and a 2007 Calendar including recipes for local meals (Sustainable SFU, 2008). Food outlets on campus are offering vegetarian options, locally grown products, ocean-wise seafood, and they also partner with sustainable food programs (SFU, 2008).

The results from this research show that universities across North America are going to great lengths and undertaking many inspirational methods to reduce their ecological footprint. Unfortunately, the efforts going towards waste management and reduction appear to be minimal. This is an area where UBC can become a leader and provide examples for other universities on the best ways to deal with waste from food production.

## Our Current Situation

Currently, UBC is one of the top rated universities at reducing carbon footprints and in waste reduction initiatives. The College Sustainability Report Card rated UBC amongst 25 other universities as Sustainability Leaders (College Sustainability Report Card, 2008). The AMS, as an advocate of student interests, has already approved a policy for Environmental Sustainability consistency and efficacy, and is committed to establishing more environmentally sound procedures to benefit UBC as a whole (Doherty, 2008). The AMS recognizes the ecological catastrophe that our modern society faces and has become one of the few organizations to take steps towards sustainability within the University community. Beginning in 1998, the AMS implemented a series of actions to lower the ecological footprint. One of the most pronounced initiatives was the promotion of the U-pass program. It not only saved students more than \$3 million per month but also reduced greenhouse emissions by more than 16,000 tonnes per year (U-Pass, 2007). The AMS also reduces SUB electricity consumption by 1million kWh per year by working with UBC Land and Building Services (Doherty, 2007). In addition, waste reduction programs are performed throughout the AMS outlets, for example students who bring their own mug receive discounts. The AMS purchases 30% recycled paper in cooperation with UBC Supply Management and electronic documents as used as much as possible. Lastly, by



working with UBC Waste Management, the AMS is able to compost 100% of pre-consumer food waste and some post-consumer food and paper waste. Working with the UBC Farm and the UBCFSP allowed the AMS to purchase organically grown food right on campus. Apart from that, the AMS also supports the UBC farm through incorporating farm produce into AMS catering menus, staff Christmas parties, and Pie R Squared pizza (N. Toogood, Personal Communication, April 1, 2008).

In order to progress in lowering the ecological footprint of any establishment, research should be completed to determine the source of the greatest problems. The AMSLFS document has done this, and identified food as approximately 30% of the consumer footprint area (Doherty, 2008). The document also includes that the food and beverage department is the largest area where they can independently focus. The AMSLFS has proposed both internal targets, which include strategies and goals for the AMS, and interactive targets, for example cooperative strategies including other campus bodies or organizations. Some of these proposed targets have lengthy timelines, such as the reduction of the ecological footprint average of foods and beverages sold by October 31st 2011. As a general target, specific objectives need to be discussed and put into action in order to compliment this large and general goal (Doherty, 2008). To assess and make recommendations within this field however, it must be further broken down into specific areas.

## Discussion

In February of 2007 the AMS food outlet, Blue Chip Coffee, consumed 18,850 paper cups (Chandran, 2007). An average of 673 cups is used per day. Because paper products consume 2-3 times their weight in trees, in one month, this equates to approximately 622.05 kilograms of wood (World Watch Institute, 2008). Paper use has become a huge problem in the world today with global consumption of paper increasing 6-fold over the 20th century and doubling since the mid 1970s. Not only does paper make up 40% of municipal solid waste in most industrial countries, but it makes up for 1/5 of the wood harvest in the United States (World Watch Institute, 2008). Although trees can be

replanted, this increases pesticide, herbicide, fertilizer and other petrochemical use. The replanted trees are monocultures, not forests and so reduction and reuse of paper products not only saves trees but, “saves forests” (Conservatree, 2008). The most prominent solution is to reduce the amount consumed (Conservatree, 2008). In the context of the AMSFBD, preventing the consumption of paper products by introducing biodegradable containers can reduce the amount of material entering the landfill and the amount of trees consumed but further research, such as that being done by UBC SEEDS, is needed on containers (reusable or biodegradable) to determine which one has the lowest ecological footprint (UBC SEEDS, 2007).

Paper products can be recycled at UBC as well as composted at the composting facility on campus. As mentioned earlier, the facility can compost up to 5 tonnes of organic waste daily, which means that all of the paper cups consumed on campus could be diverted from the landfill and composted at UBC (Chandran, 2007). Decreasing the amount of waste produced and recycling are good methods to reduce the ecological footprint caused by takeout containers.

When investigating options for takeout containers with the lowest ecological footprint, there are several issues to consider. Paper or other biodegradable products, which can be composted, seem ideal because there is no waste produced however the inputs that went into the biodegradable containers must also be considered. Locally produced containers will decrease the amount of miles that the container would have traveled and thereby decreasing emitted greenhouse gases. There is also the issue of petrol consumption in container manufacturing. Paper cups consume 4.1g of petrol chemicals and 33g of wood chips (Chandran, 2007). However, foam consumes 3.2g of petrol chemicals and 0g of wood chips but it cannot be recycled or composted (Chandran, 2007). As discussed at the Roundtable on Food and Climate Change, materials that can be composted end up using less energy than materials that must be sent to the landfill (2008). Purchasing materials locally also helps to decrease the impact on the environment of the material (Roundtable on Food and Climate Change, 2008). This is significant for the Pendulum restaurant that has biodegradable containers but purchases them from

China (N. Toogood, personal communication, April 1, 2008). The compost from these products can then be used to provide soil for the university. These discussions conclude that there is a need to eliminate non-biodegradable Styrofoam and replace it with a reusable or biodegradable material (Roundtable on Food and Climate Change, 2008).

Studies have been conducted by UBC SEEDS (Social, Ecological and Economic Development Studies) to make recommendations for use of reusable mugs, on methods of reducing litter and encouraging students to reduce, reuse, recycle. Research that is being done at the university includes: the costs and benefits of reusable vs. compostable containers, the costs and benefits of materials that are 80-100% recycled materials and the determination of the most environmentally-friendly and cost effective disposable takeout container (Doherty, 2008). This is a formidable start with regards to the lowering UBC's ecological footprint.

Furthermore, it is important to look at the plastic cutlery presently being used, for ways to help reduce the footprint. An option we have looked into is to replace them with Aspenware WUN utensils (see appendix 9). These utensils are made in British Columbia using gentrified firewood. They are 100% natural and can be completely broken down in 65 days. The company uses methods that are environmentally friendly in making the utensils, thus, reducing their ecological footprint (Aspenware, 2008). By switching to compostable utensils the total amount of land-fill waste becomes reduced.

On that note, the amount of composting being done is another area where the AMS and UBC could improve their waste management strategies. As of now, at least 77% of the 12 tonnes of waste that UBC produces every day can be composted or recycled including post-consumer food waste and some paper takeout containers (UBC Plant Operations, 2007). Currently, there is only one composting station available for all AMS food outlets on campus and it is located in the basement of the SUB. In order to increase composting, more stations need to be available to customers of AMS food outlets; however, there are issues of cost and maintenance that are inhibiting their implementation. The current

compost station is maintained by a custodial employee who takes about 20 minutes of his off-shift, unpaid time to empty out the bin. In addition to the problem of finding staff to maintain the bin, the cost of constructing each compost bin is at least \$1000 for materials which AMS has no funds (N. Toogood, Personal Communication, April 1, 2008).

### Survey (see Appendix 1 & 2)

One of the methods used to determine student interest in waste reduction was a survey. The goal of this survey was to find out what percentage of a sample of people in the SUB at lunchtime brought their own reusable container to school. We also wanted to find out if students would be willing to purchase a reasonably priced reusable container in order to reduce the amount of waste created by disposable containers. The results of this survey allowed us to make recommendations on the overall use and distribution of reusable containers in the AMS outlets. It consisted of twelve questions ranging from affiliation to UBC, program, age, and gender, to bringing reusable containers to campus and willingness to purchase reusable containers from the AMS.

Firstly, the relationship between faculty and if the respondent brings their own reusable container to school was looked at.

- The null hypothesis (Ho) there is no relationship between faculties and if the respondent brings reusable containers to school.
- The alternative hypothesis (Ha) there is a relationship between faculties and if the respondent brings reusable containers to school.

The findings of this chi-squared analysis showed that there was no correlation between the two variables so we failed to reject the null hypothesis. A bias may exist in this data due to the amount of people from specific faculties that were surveyed. Only three people from LFS were surveyed and two of those people brought their own containers. One engineer was surveyed and he brought his own

container while twenty-two people were surveyed from arts and only four of them brought their own container so this could have misrepresented the data. If a survey was going to be done in the future that focused on faculty involvement in waste management then it might be a good idea to survey an even number of people from each faculty so that the results can be compared evenly.

Secondly, a relationship between faculty and willingness to purchase a reasonably priced reusable container from the AMS was looked at.

- Ho: there is no relationship between faculty and willingness to buy a reusable container for a reasonable price from the AMS.
- Ha: there is a relationship between faculty and willingness to buy a reusable container for a reasonable price from the AMS.

The chi-squared analysis found that there was no correlation between the two variables and so we failed to reject the null hypothesis. About 41% of respondents said they would be willing to buy a reusable container. A bias that may exist here could be the size of the sample chosen. 49 respondents is large enough to eliminate most sampling errors but not large enough to be confident that your sample size is representative of the population in question, in this case, UBC.

The third correlation that was examined was between bringing a reusable container and willingness to purchase a reusable container from the AMS for a reasonable price.

- Ho: there is no relationship between bringing a reusable container to school and willingness to buy a reusable container from the AMS for a reasonable price.
- Ha: there is a relationship between bringing a reusable container to school and willingness to buy a reusable container from the AMS for a reasonable price.

The chi-squared analysis found that there was no correlation between the two variables so we

failed to reject the null hypothesis. What we were interested in was if the respondent said no to bringing their own reusable container did they say yes to being willing to purchase a reusable container from the AMS. 46% of respondents that did not bring their own container said they would be willing to purchase one from the AMS. 25% of respondents that did bring their own container also said they would be willing to purchase an additional one from the AMS. This data shows that about half of the population that does not bring their own reusable containers would be willing to purchase one from the AMS. 46% may not be large enough to fully implement selling reusable containers in all AMS outlets but it is large enough to sell containers at one or two outlets for a trial period.

The final question that the survey asked was about what factors would encourage the respondent to bring their own container to school. The possible answers and percentages of people choosing them included:

- Larger bring-your-own container discounts. 34%
- More information about the importance of reusable containers. 11%
- Information about how much waste is produced from disposable containers. 15%
- Access to sinks in the SUB. 9.5%
- The option to purchase space efficient reusable containers in the SUB. 17%
- Other 13%

This information is useful because it shows students' wants. Providing larger reusable container discounts at AMS outlets seems to be popular so it might be beneficial for the AMS to look into increasing the discounts to further encourage students to bring their own container. The answers about providing more information on waste and the importance of reusable containers can be used when determining marketing options for the future.

## Findings from Past Papers

According to AGSC 450 2007 group 21 there is not enough student awareness about

composting and recycling. A one-day observation by the group found that only 27% of the students composted correctly (AGSC 450 group 21, 2007). After meeting with various stakeholders such as the AMSFBD, UBC Food Services and UBC Waste Management, we discovered that there were many initiatives in place with the intention of bringing awareness to the issue but the message was not reaching the students effectively. For example, in January 2007, the Get Caught Composting Campaign (GCCC), initiated by previous AGSC 450 students, was launched. The GCCC was created to increase awareness by giving incentives to those who composted properly. Volunteers recruited from Wastefree UBC would find people composting correctly, distribute a button promoting the campaign and enter their names into a draw held at the end of the year. The suggested prizes could include an Ipad or a gift certificate from the UBC Bookstore (AGSC 450 Group 2, 2006). More than a year after the initiative was conceptualized, GCCC is still relatively unknown (AGSC 450 Group 23, 2007).

Last year Group 8 worked with the manager of Café Perugia, Josie Midha, to bring greater awareness about composting and recycling. Café Perugia had some signs encouraging composting but the group felt that there could be improvement. They created more signs and harmonized all of them. Before implementing the signs the group measured the amount of compost in the bins over the course of three consecutive days. The group put up the new signs and a week later they weighed the compost bins again using the same procedures. They found that the compost weight had increased by almost 20% (AGSC 450 group 8, 2007). The results showed that the new signs proved to be effective. In 2007, AGSC 450 group 19 arranged a focus group to develop more useful signs (AGSC 450 Group 19, 2007). The “ideal” sign was very similar to what group 8 had created (see Appendix 3).

As part of GCCC, the AGSC 2006 group 2 developed a button to be awarded to students who composted correctly. However, AGSC 450 2007 group 23 reported that their focus group had trouble making a connection between composting and the picture of the monkey that was originally designed for the campaign (see Appendix 4).

Another AGSC 450 group created a Bin Basketball game where they used 3 bins; green for

composting, gray for recycling, and black for garbage. They found that many students who participated did not know how to compost and recycle properly. After playing the game the participants were given a survey and it was reported that awareness had increased by 100% (AGSC 450 group 21, 2007).

## Recommendations

### For the AMS:

1. **Increase composting awareness with "road signs"**. Analogous to the "Check Fuel... Next Service Station 5km ahead" road signs, these reminders will both encourage composting and provide directions to the nearest compost bin. The signs should be placed close to food outlets and at entrances to buildings containing compost bins. The best locations for the signs must be determined and the distance between sign and bin must be calculated. A measurement of total organic waste that ends up in the garbage would be an important indicator of this strategy's success. We have designed the proposed road sign (see Appendix 6). It is important to promote these road signs as a practical way to reduce organic waste in a university or community. Awareness is a factor in student and public action, as is seen in the university examples of UVIC and other initiatives at UBC (M'Gonigle & Starke, 2006).
2. **Construct a second composting bin for the AMSFBD on the main floor of the SUB**. As the SUB currently only has one compost bin in the lower level. This strategy could be completed by the end of 2008 assuming the construction costs of \$1000 could be acquired (N. Toogood, Personal Communication, April 1, 2008). Baseline and follow-up surveys would need to be completed to determine the effectiveness of additional compost bins. Money would also need to be raised to cover construction costs and the bins would need to be promoted. An indicator could be found if the amount of compost created increases. If the bin is deemed a success then by the beginning of 2010 we would like to see some sort of composting bin at every major exit in the SUB as well as at least one bin in



every building on campus.

3. **Further encourage people to bring their own reusable container as well as sell collapsible, reusable containers in some of their outlets.** The containers we are recommending are collapsible, dishwasher and microwave safe, and come with a lid (see Appendix 7). We believe this type of container would appeal to people due to its compact size, its user-friendly design, and its overall aesthetic appeal. The AMS would need to purchase a small sample of collapsible containers by fall of 2008 to sell at one or two outlets as a trial. A marketing campaign would need to be created that promotes the container as well as the discount that customers get for bringing their own mug. The program would be deemed successful if many containers were sold and if more people start bringing them to AMS outlets. If it is successful then all AMS outlets should start selling these containers by Spring of 2009 and promoting the use of reusable containers.

4. **Our long-term recommendation for the AMS is to locate a local source of biodegradable containers that have a lower ecological footprint than that of Styrofoam** (D. Yip, Personal Communication, April 2, 2008). The current compostable cups at Blue Chip Cookies are a prime example of a good step towards this initiative. Although it is essential to encourage consumers to bring their own reusable container, our survey showed that only 33.95% of consumers did, so the need for compostable containers prevails.

5. **Label all biodegradable and/or recyclable materials with large pressed symbols or phrases like “compost me” within the next 2 years.** Some of the waste reduction methods at the AMS include disposable paper cups from Blue Chip Cookies and the paper bags for baked goods are fully biodegradable, while the plastic containers offered in Honor Roll are not recyclable. Nevertheless, because of the absence of proper labeling, most students are unaware of these properties and simply throw them away as garbage. The AMS could work with its current suppliers to develop effective and

inexpensive labels or logos. To cover the additional cost, the AMS may look for businesses that are willing to contribute to the green movement. Phrases like “sponsored by XXX” would recognize their contribution and create publicity for the company. With this initiative, posters or brochures should be distributed throughout the food outlet to raise awareness about the use and proper disposal of these environmental friendly materials. Two months after the label program is launched, the amount of normal waste should be compared to that before the promotion to monitor proper waste sorting. If the amount of waste has not been reduced, additional actions should be taken.

6. **Print a quiz page (see Appendix 8) in the yearly student agenda.** An interactive page allows for a better understand of the negative ecological effects students have on the environment by not composting.

7. **Establish a student committee to promote the GCCC and recruit volunteer “spies” to catch people composting and to incorporate initiatives such as Bin Basketball.** To encourage students to compost properly, a draw for a substantial prize (eg. Ipod) should be conducted at the end of each term. An LFS faculty member, such as an AGSC 250, 350 or 450 teaching assistant should be a part of this committee so that students from AGSC 100 can participate as part of their service learning assignment. Once the committee has been established we recommend that Bin Basketball be held in the SUB, twice in term 1 (September to November) and once in term 2 (January to March) to educate people on proper composting procedures at UBC.

### For the AMS & UBC Waste Management:

1. **Work with UBC Waste Management to perform a garbage audit.** An audit that is analogous to Felder's audit in 1998. This audit helped to initiate the UBC Compost Project, which produces almost enough compost for UBC's gardens (UBC Waste Management, 2008). This would help determine the impact that composting bins are having on the amount of compostable material found in

the garbage.

### For all UBC Food Outlets:

1. **Replace plastic utensils with WUN wood utensils.** These utensils are completely biodegradable and as such help to reduce the ecological footprint and contamination of the UBC in-vessel composting system. Look for corporate sponsorship to offset the cost.
2. **Harmonize their composting/recycling signage.** Not only will this unite all food service outlets towards the goal of reducing the ecological footprint but it will also make composting easier and more efficient as students become more accustomed to the same signs.
3. **Use the same signs that AGSC 450 2007 group 8 created for Cafe Perugia throughout campus.** This decision is based on research done by AGSC 450 2007 group 19.
4. **Promote composting awareness by having all food service staff wear the new button that has been developed (see Appendix 5).** Josie Midha thought that this was a great idea (Personal Communication, April 1, 2008). The button could also be distributed to students, thereby, further promoting awareness. People in society want to fit in so if they observe others doing an act, they are likely to do the same act. Moreover, when people are committed to wearing the buttons, they also feel a sense of obligation to follow through with what the message is conveying for fear of being viewed as contradictory (Mackenzie-Mohr, 1999).

### For Future AGSC 450 Students

1. **We suggest a series of surveys be completed, both in the SUB and in other areas around campus to determine the most effective methods to reduce the amount of recyclable material that is being thrown away.** The findings of these surveys should go to groups such as the AMS lighter footprint strategy consultants, and the sustainability office manager to use when creating further waste

reduction initiatives. Students in next years AGSC 450 class could focus on formatting these surveys themselves or working with the results if the surveys have already been completed. The results of the survey should provide a blueprint for the AMS LFS to reduce waste and increase recycling and composting. It may also shed light on which demographics need additional focus (Doherty, 2008). Depending on the questions asked in the survey, a short term recommendation would be to complete this survey before action is taken, and once again after awareness campaigns or other strategies have taken place. The survey would be used as a tool to track progress from a baseline (the first survey) to strategy completion.

2. **Future students should aim to find funding that would enable compost bins to be placed throughout the AMS.** UBC Plant Operations charges \$35/hour for custodial staff (UBC Plant Operations, 2008). This is an amount that the AMS cannot afford to pay along with the inability of plant operations to supply enough workers to fill this position (K. Gibbons, Personal Communication, April 1, 2008). One option may be to access funding through the sustainability office. Miriam Stein mentioned there is a budget for sustainability initiatives, which would include this recommendation. If funding should be available we suggest that compost bins be purchased in accordance with the above recommendation. Additionally, a student could be hired at an hourly rate for less than the rate charged out by Plant Operations to maintain the compost bins, which are currently looked after by a staff member on his own time (N. Toogood, Personal Communication, March 19, 2008).

3. **We would like future students in AGSC 450 to determine the best discount for both customers and the AMS and to find out the steps needed to implement a larger discount.** As stated in our research we found that customers are interested in larger discounts for bringing their own container to an AMS outlet.

4. **We would like future students in AGSC 450 to promote the “Get Caught Composting”**

**page on Facebook.** The page, originally suggested by AGSC 450 2007 group 23 has now been created.

### For AGSC 450 Instructors

1. **We propose the creation of a one credit AGSC course mandatory for all first year UBC students.** We feel that all students on campus should be given the opportunity to be exposed to concepts and issues surrounding our land, food and community. Course material should include a general overview of our food system; social, economical and ecological impacts; and the concept of sustainability. Five hours of environmental work would be mandatory for all students enrolled in this course.
2. **AGSC 450 students should be allowed to pick their own groups if they wish.** By fourth year, students know whom they work well with. As a result, we believe that students would acquire higher academic success if they were able to work with others of similar interests and bring the course to new levels.

## Conclusion

This research clearly identifies the required changes that need to be made in order for the AMS, and thus, UBC to become leaders in waste management. Although, waste is only one of the components and contributors to the campus's ecological footprint, it is indeed one of the largest. Initially, incorporating such things as new marketing schemes and increasing the number of compost bins in the SUB will likely only create small change, over time, as the university population becomes more familiar with such topics and programs, change will become more evident. It is our hope that this topic will become of greater importance to the leaders of this campus as funding is one of the major limiting factors to the implementation and effectiveness of this type of program, thus, until this is recognized waste management will continue to be an issue on campus. We have great faith in the students of AGSC 450 and faculty and staff of UBC to ensure that this program, or a form of it, is carried through to its full capacity. As a result, if UBC wants to be an influence on a national and international scale than the choice to live by the old adage by Mahatma Gandhi "Be the change you want to see in the World" should be a simple one.

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**Appendix 1: Survey**

1. What is your affiliation with UBC?
  - a. Undergraduate student.
  - b. Graduate student.
  - c. Faculty.
  - d. Staff.
  - e. Visitor.
  - f. Other (Please specify).
2. Please indicate your year of study.
  - a. First.
  - b. Second.
  - c. Third.
  - d. Fourth.
  - e. Fifth.
  - f. Graduate level.
  - g. Other.
  - h. Does not apply.
3. What is your gender?
  - a. Male.
  - b. Female.
  - c. Other.
4. What is your age?
  - a. 18 and under.
  - b. 19-24.
  - c. 25-31.
  - d. 32-55.
  - e. 56 and over.
5. If applicable, please indicate your program or field of specialization.
6. Do you bring reusable containers to school for on campus purchases of food?
  - a. Yes.
  - b. No.
7. If no, what is the main reason why you don't?
  - a. Size.
  - b. Convenience.
  - c. Cost.
  - d. Don't care.
  - e. Other (please specify).
8. If yes, how often do you bring your own reusable container?
  - a. Every Day.
  - b. 1-4 times a week.
  - c. Once a week.
  - d. Once a month.
9. If yes, what kind of reusable container do you bring?
  - a. Mug.
  - b. Plate.
  - c. Bowl.
  - d. Other (please specify).
10. If you had the opportunity to buy a reusable container at the AMS for a reasonable price (ex. \$5), would you?
  - a. Yes.
  - b. No.
11. If size or convenience were a deterrent for why you don't bring containers would you be willing to use a collapsible container like this?
  - a. Yes.
  - b. No.
12. What factors, if any, would influence you to bring your own reusable container?
  - a. Larger bring your own container discounts.
  - b. More information about the importance of reusable containers.
  - c. Information on how much waste is produced from disposable containers.
  - d. Access to sinks in the Sub.
  - e. The option to purchase space efficient reusable containers in the Sub.
  - f. Other (please specify).

**Appendix 2: Statistic Results**

**Question 5 vs. Question 6:**  
**H0:** There is no relationship between faculty and if they respond bring reusable containers to school.  
**Ha:** There is a relationship between faculty and if they respond bring reusable containers to school.

table 2 faculty bring container, chi2 cell.

Faculty	1	2	Total
0	1	4	5
1	2.04	8.16	10.20
2	4	18	22
3	8.16	36.73	44.90
4	4	9	13
5	8.16	18.37	26.53
6	4	2	6
7	4.08	2.04	6.12
8	5	1	6
9	2.04	0.00	2.04
10	0	5	5
11	0.00	10.20	10.20
Total	12	37	49
Bring container 1 = Yes	24.49	75.51	100.00
Bring container 2 = No	Pearson chi2(5) = 8.3959 Pr = 0.136.		

**Legend:**  
 Faculty 0 = No Response.  
 Faculty 1 = Arts.  
 Faculty 2 = Science.  
 Faculty 3 = Forestry.  
 Faculty 4 = LFS.  
 Faculty 5 = Engineering.  
 Faculty 6 = Commerce.  
 Bring container 1 = Yes.  
 Bring container 2 = No.

**Question 5 vs. Question 10:**

**H0:** There is no relationship between faculty and willingness to buy a reusable container for a reasonable price from the AMS.  
**Ha:** There is a relationship between faculty and willingness to buy a reusable container for a reasonable price from the AMS.

table 2 faculty buy more, chi2 cell.

Faculty	1	2	Total
Buy more	1	2	3

	0	2	3	5
	4.08	6.12	10.20	
1	18.37	26.53	44.90	
2	12.24	14.29	26.53	
4	2.04	4.08	6.12	
5	0	1	1	
	0.00	2.04	2.04	
6	4.08	6.12	10.20	
Total	20	29	49	
	40.82	59.18	100.00	

Pearson  $\chi^2(5) = 0.9153$  Pr = 0.969

Question 6 vs. Question 10.  
 Ho: There is no relationship between bringing a reusable container to school and willingness to buy a reusable container from the AMS for a reasonable price.  
 Ha: There is a relationship between bringing a reusable container to school and willingness to buy a reusable container from the AMS for a reasonable price.

	1	2	Total
Bring container	17	20	
Buymore	6.12	34.69	40.82
2	9	20	29
	18.37	40.82	59.18
Total	12	37	49
	24.49	75.51	100.00

Pearson  $\chi^2(1) = 1.6457$  Pr = 0.200

Legend  
 Bring\_container 1 = Yes  
 Bring\_container 1 = No

Buymore 1 = Yes

Stats on buying a container.  
 tabulate buymore.

Buymore	Freq.	Percent	Cum.
1	20	40.82	40.82
2	29	59.18	100.00
Total	49	100.00	

40.82% of individuals surveyed would buy a reusable container.

What factors would influence you to bring your own reusable container.  
 tabulate factors.

factors	Freq.	Percent	Cum.
0	1	2.04	2.04
1	15	30.61	32.65
2	6	12.24	44.90
3	6	12.24	57.14
4	3	6.12	63.27
5	6	12.24	75.51
6	4	8.16	83.67
13	2	4.08	87.76
15	2	4.08	91.84
16	1	2.04	93.88
145	2	4.08	97.96
2345	1	2.04	100.00
Total	49	100.00	

Legend  
 factors 0 = No response.  
 factors 1 = Larger bring-your-own container discounts.  
 factors 2 = More information about the importance of reusable containers.  
 factors 3 = Information about how much waste is produced from disposable containers.  
 factors 4 = Access to sinks in the Sub.  
 factors 5 = The option to purchase space efficient reusable containers in the SUB.  
 factors 6 = Other.  
 factors 13 = Choose more than one factor: factors 1 and 3.  
 factors 15 = Choose more than one factor: factors 1 and 5.  
 factors 16 = Choose more than one factor: factors 1 and 6.  
 Factor 145 = Choose more than one factor: factors 1, 4 and 5.  
 Factor 2345 = Choose more than one factor: factors 2, 3, 4 and 5

Buymore 2 = No

Stats on Bringing Own Container.  
 tabulate bringcontainer.

Bring container	Freq.	Percent	Cum.
1	12	24.49	24.49
2	37	75.51	100.00
Total	49	100.00	

Legend  
 Factor 0 = No response.  
 Factor 1 = Larger bring-your-own container discounts.  
 Factor 2 = More information about the importance of reusable containers.  
 Factor 3 = Information about how much waste is produced from disposable containers.  
 Factor 4 = Access to sinks in the Sub.  
 Factor 5 = The option to purchase space efficient reusable containers in the SUB.  
 Factor 6 = Other.  
 Factor 13 = Choose more than one factor: factors 1 and 3.  
 Factor 15 = Choose more than one factor: factors 1 and 5.  
 Factor 16 = Choose more than one factor: factors 1 and 6.  
 Factor 145 = Choose more than one factor: factors 1, 4 and 5.  
 Factor 2345 = Choose more than one factor: factors 2, 3, 4 and 5

## Appendix 3: Ideal Harmonizing Signs

### Get Caught Composting!



#### What to compost:

✓ YES	✗ NO
✓ All food waste	✗ Styrofoam containers
✓ Coffee cups	✗ Plastic coffee lids
✓ Paper pastry bags	✗ Wooden stir sticks
✓ Checkered tray liners	✗ Milk cartons

#### Compost here!



### Get Caught Composting!



#### You can compost most coffee waste!

- ✓ Coffee cups
- ✓ Napkins
- ✓ Sugar packets
- ✗ Not lids and stir sticks

#### Compost at the waste station!



## Appendix 4: Old GCC Button



## Appendix 5: New GCC Button

[www.sixcentpress.com](http://www.sixcentpress.com)



## Appendix 6: Road Sign












## Appendix 7: Reusable Container

<http://www.rubbermaid.com/rubbermaid/collapsibles/collapsibles.jhtml>



## Appendix 8: Proposed Student Agenda Quiz Page

1. How much waste does the university generate everyday?..

- 500 kilograms..
- 1000 kilograms..
- 5000 kilograms..
- More than 10,000 kilograms..

2. What percentage of this garbage can be composted or recycled?..


- 10%..
- 25%..
- 50%..
- More than 75%..

3. All of the following are compostable except for..

- coffee cups at Blue Chip Cookies..
- wooden chopsticks..
- a hamburger and fries..
- used napkins..

4. How many compost bins are in the SUB?..

- none..
- two..
- five..
- seven..



**Did you know ??**

The AMS has become a part of the Get Caught Composting Campaign. If someone spots you composting properly, you could get your name entered into a draw for an i-pod or a \$100 gift certificate from the bookstore..

UBC is the only University in all of Canada that has its own in-vessel composting facility that can process up to five tonnes of organic waste every day..

If you bring your own re-usable mug or container a \$0.25 discount is offered at AMS food outlets. If you bought a cup of coffee everyday Monday –Friday you would save \$1.25. ..

Blue chip cookies used 18,850 paper cups in a month. That is equivalent to 1 medium sized cotton wood tree. If everyone one brought their own re-usable container 12 trees a year could be saved. ..

## Appendix 9: Aspenware Biodegradable Utensils

In envelope

## Appendix 10: Food UBC Table Tent

In envelope