

THE UBC FOOD SYSTEM PROJECT SUMMARY REPORT 2012

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THE UBC FOOD SYSTEM PROJECT

SUMMARY REPORT 2012

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Introduction

The University of British Columbia Food System Project (UBCFSP) is a collaborative project engaging students and key campus operational units and academic departments across the UBC Vancouver campus. Together, these actors aim to improve the sustainability of the UBC campus food system through student action-research projects.

The Faculty of Land and Food Systems and the Social, Ecological Economic Development Studies (SEEDS) Program founded the project in 2001. To date, 12 generations of the project representing over 1688 students have conducted and applied research addressing key food system sustainability challenges on the UBC-Vancouver campus.

The UBCFSP is coordinated by the UBC Food Systems Project Coordinator and is directed by the UBC Food System Committee. The Committee is composed of a group of individuals representing key food system actors across campus. The Coordinator works out of Campus Sustainability through the SEEDS Program.

UBCFSP Goals

The following goals express the long-term and guiding vision for the UBC Food System Project. The goals encompass project values, structural components, and on-going food action commitments. These goals have been identified by the UBC Food Systems Project Committee.

The UBC Food System Project aims to:

1. Move the UBC campus food system towards sustainability, by:
 - a. Facilitating a shared vision of a sustainable food system among project partners (key food system actors);
 - b. Coordinating project partners and other key campus food systems stakeholders in their efforts to improve the campus food system;
 - c. Creating 'Campus as a Living Lab' projects that enable students to work on applied food system sustainability projects related to their program specializations.
2. Positively impact the movement towards the sustainability of the larger BC, Canadian, North American and World food systems, by:
 - a. Leading as a model for best practices for sustainable food systems;
 - b. Using UBC's leverage to influence the supply chain and broader sustainability practices.

UBCFSP Partners

1. UBC Campus Sustainability (CS)
2. Social Ecological Economic Development Studies (SEEDS) Program
3. The Faculty of Land and Food Systems (LFS)
4. UBC Food Services (UBCFSP)
5. Student Housing and Hospitality Services (SHHS)
6. AMS Food and Beverage Department (AMSFBD)
7. Centre for Sustainable Food Systems at UBC Farm (UBC Farm)
8. Alma Mater Society (AMS)
9. UBC Campus and Community Planning (C+CP)
10. UBC Waste Management (UBCWM)
11. UBC Building Operations
12. Sprouts
13. Agora Café
14. Orchard Garden

Project Design

The UBCFSP project utilizes the Community-Based Action Research (CBAR) methodology. Stringer (1999) explains that the main goals of CBAR are to capture the many perspectives on an issue and to incorporate these in the planning and implementing of appropriate courses of action. In this way, CBAR brings the community into the research process and assures that the research findings be returned to the community (Stringer, 1999). As can be seen in the UBCFSP, the community is defined as the core food system actors within the UBC Vancouver campus. These community members identify and define the challenges and opportunities in the campus food system and participate in the planning and implementation of research and solutions. This is an iterative process, in which research, action and reflection are performed in an annual cycle.

Each year, the UBCFSP consists of three distinct phases. From August to December, the UBCFSP Coordinator, in consultation with the project partners, SEEDS Program Coordinator and the LFS 450 instructor, drafts a series of scenarios, or student projects, focusing on the most current food system opportunities and challenges as identified by project partners. Starting in January, each LFS 450 student selects a scenario of interests to him/her. Groups of four to seven students work on their chosen scenario by conducting research, investigating topics, implementing plans of action and/or developing resource materials. Students interact with their UBCFSP community partner on a regular basis. The community partner acts as a resource, gives feedback and direction throughout the project, reviews materials produced by the students and collaborates on implementing the actions as necessary. In the summer months, May to August, the UBCFSP Coordinator reviews the student reports and compiles a summary report. Also, over the course of the summer months, the UBCFSP Coordinator meets with the appropriate partners and stakeholders to report the student group findings and to determine the implementation potential of student recommendations and provide further support as needed. During this period, the next generation of scenarios is identified.

For further information on the project, including the "UBCFSP Vision for a Sustainable Food System," please visit the project website.

Report Objective

The purpose of this report is to provide a summary of the 2012 iteration of the UBCFSP. Specifically, in this report a summary of the objectives, methods, findings and recommendations of the 2012 student projects are described.

Overview of the 2012 UBCFSP

Annual Partner Workshop

The Annual Partner Workshop was held July 19th, 2012.

- In attendance:
 - UBC Food Services: Loriann McGowan, Victoria Wakefield
 - Alma Matter Society: Nancy Toogood, Justin Ritchie, Andrew Longhurst
 - Land and Food Systems: Andrew Riseman, Joshua Edwards
 - Campus Sustainability/SEEDS: Liska Richer, Sophia Baker-French
 - UBC Farm: Amy Frye, Veronik Campbell
 - The Orchard Garden: Jay Baker French
 - Sprouts: Nicole Jahraus
- Main outcomes:
 - The UBC Food Systems Committee title was adopted. The committee will consist of representatives from UBC Food Services, AMS Food and Beverage Department (Sprouts), AMS, Land and Food System (Orchard Garden), Campus Sustainability/SEEDS, UBC Farm, UBC Waste Management, UBC Building Operations. Other groups may be added to the committee in the future.
 - A 'Food Action Plan' will be developed to help guide the actions of the project. The plan may be used as a monitoring and evaluation tool in the future.

UBCFSP Communication Update

In the 2011 Annual Partner Workshop, partners identified the need to “tell the story” of the UBC Food System Project. It was felt that the project accomplishments should be better shared with the campus community in an effort to facilitate use and recognition of sustainable changes made on campus. In an effort to answer this call to action, the UBCFSP now has a webpage and will be launching a UBC Sustainable Campus Food Guide.

The UBC Food Systems project website is located on the UBC Sustain webpage. This will now be the project's primary place to communicate with the campus and wider community.

Additionally, through the efforts of students, project partners' and the UBCFSP Coordinator the first ever 'UBC Sustainable Campus Food Guide' will be launched in January 2013. The guide will highlight many of the sustainable food initiatives across campus and will help student connect and engage with the campus food system.

List of the 2012 scenarios

This year marks the 12th generation of UBCFSP scenarios. This year, there were 13 groups and 63 students involved in the project.

Scenario	Title
1.	Baseline Inventory of the UBC Food System: Healthy food situation assessment and action plan
2.	Baseline Inventory of the UBC Food System: GHG Emissions of food products and action plan
3.	Baseline Inventory of the UBC Food System: Socially and Ecologically Responsible Food Options and Action Plan
4.	Baseline Inventory of the UBC Food System: Aboriginal & Ethnic foods on campus
5.	Baseline Survey of the UBC Food System: Public Opinion to Inform Food System Targets
6.	Campus Greenscaping: Management the First Rooftop Garden at UBC-Vancouver
7.	UBC Farm Pilot Food Processing Center
8.	UBC Campus Food Guide - A UBC Farm Communication Tool

Methods

In collaboration with the appropriate project partner, the UBCFSP Coordinator drafted each of the scenarios. The SEEDS Program Coordinator assisted in drafting and approved the scenarios. The LFS 450 instructor gave the final approval for the scenarios.

To carry out the research for these scenarios, the students used diverse methods of data collection including key informant interviews, focus groups, round table discussions, surveys, field observation, and literature review. Throughout the semester-long projects, each student team consulted and collaborated with the scenario project partners, other key community stakeholders, the UBCFSP Coordinator and the teaching team. As the projects progressed, these interactions ensured that the projects continued to meet the needs of all the participating community actors.

Each student group provided a 30-page report and a 15-minute presentation summarizing their project methods, actions, findings and recommendations. Each student group evaluated their project. In most cases, students deemed their project successful if the group accomplished their objective and satisfied the expectations of the community partner. The course instructor also evaluated the project reports and presentations for a mark. The UBCFSP Coordinator reviewed and approved the reports for inclusion in this summary report. The projects are summarized according to scenario in the following pages of this report.

Scenarios 1-5: Baseline Inventory of the UBC Food System

Background

Previous evaluation of the UBC food system was carried out using standards set by external organizations such as Sustainability Tracking, Assessment and Rating System (STARS), Sustainable Endowments Institute I (SEI) and the College Sustainability Report Card. Often, UBC outperforms the provided standards but is unable to report these many additional achievements. Over the past 10 years of the UBC Food System Project (UBCFSP) improvements to the food system have been recorded but not measured. The UBCFSP partners have embarked on an evaluative audit of the sustainability of the UBC food system using key indicators derived from the UBCFSP's "Vision for a Sustainable Food System." In this way, the UBCFSP can use its own rigorous standards to evaluate the food system. The findings will help inform project partners where the campus food system is performing well and where it can improve.

Scenario 1: Baseline Inventory- Healthy food situation assessment & action plan

Project Partner(s): UBC Food Services, AMS Food and Beverage Department (AMSFBD), Campus Sustainability

Group(s): Group 1 and Group 2

Full Paper Links:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_HealthyFoodSituationAssessmentAndActionPlan_group1_VendingMachines_FINAL.pdf
- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_HealthyFoodSituationAssessmentAndActionPlan_group2_HealthyFood_FINAL.pdf

Background

This scenario was born out of the observation that snack foods on campus tend to be unhealthy. As human health and thus nutrition is part of the UBCFSP's Vision of a Sustainable Food System, it was deemed appropriate to explore this topic as one of the focuses of the campus inventory. In 2007, the province of BC provided healthy food guidelines for food procurement on school campuses and publicly owned building premises. Since UBC falls in this category, this scenario aims to use these guidelines as

well as a handful of indicators derived from the UBCFSP Vision for a Sustainable Food System to gauge how well UBC food providers are doing at providing healthy snack food options across campus.

Objective

The student groups were asked to conduct a baseline inventory of “healthy” snack food products sold on the UBC Campus and, if appropriate, to provide recommendations for ways the snack food offerings could be made more healthy. One group focused on vending machine products, while the other focused on small to-go items available at four food outlets on campus.

Central Findings

Context

The student groups began their reports by exploring the context for this scenario. A sampling of what they found is summarized below.

- Zweynert (2012) reported that Olivier De Shutter, the UN special reporter on the right to food, said the world is facing an international public health disaster due to the over production of cheap high calorie foods resulting in negative health outcomes in both developed and developing countries. De Shutter, among many others, has suggested taxing and regulating unhealthy food products as a potential solution. [Group 2, 2012]
- Group 1 points out that each year UBC contributes 10 billion dollars to the BC economy (UBC Public Affairs, 2012). Additionally, the Times Higher Education Reputation Ranking (2012) ranked UBC as having the 25th highest reputation amongst post-secondary institutions in the world. Together, this shows that UBC has the potential to influence both regional and global sustainability practice. [Group 1, 2012]
- In 2005, the BC government published the “Guidelines for Food and Beverage Sales in BC Schools,” most recently updated in 2010 (Act Now BC, 2010). In the guidelines food items are categorized as “choose most”, “choose sometimes”, “choose least” and “not recommended”. These same categories are used in “BC’s Nutritional Guidelines for Vending Machines in B.C. Public Buildings” (Ministry of Labour and Citizens’ Services, 2007). [Group 1, 2012]
- The Brand Name Food List is a resource maintained by the BC government that categorizes Brand name foods into the four “choose most” to “not recommended” food categories as well as into food groups such as “nuts and seeds” (Health Link BC, 2012). Group 1 noted, that the portion size of a food item can impact the categorization of the food item. They felt that this could lead to misunderstanding by consumers who may associate a specific categorization to the food item rather than to the portion size of that food item. [Group 1, 2012]

Vending Machine Findings

Literature Review

The students conducted a brief literature review and found the following important information:

- “The Healthier Choices in Vending Machines in B.C. Public Buildings Policy” (Ministry of Labour and Citizen Services, 2007) requires all vending machines located in government public building to provide “choose most” and “choose sometimes” foods and that “at least 50% of all food and beverage choices within a bank of vending machines in any given location in a building ... must be from the “choose most” category.” [Group 1, 2012]
- The BC government has also implemented a checkmark system to help consumers easily identify “choose most” (two check marks) and “choose sometimes” (one check mark) options (Act Now BC, 2008). [Group 1, 2012]
- According to Group 1, the guidelines have been well implemented in primary and secondary schools, but are lacking in post-secondary schools and public buildings. Post-secondary institutions were required to follow this policy by 2009, excluding any previously signed contracts. [Group 1, 2012]

Inventory Results

Group 1 inventoried the top 10 selling vending machines on campus: the Aquatics Centre, Brock Hall, Buchanan 2nd (B), Common Residence (Marine Drive), Gage Residence, Woodward, Koerner Library, SUB Pizza, Vanier Place, and Winter Sports (Thunderbird). For comparison's sake, a pilot “healthy” vending machine at Gage Residence was audited as was a vending machine supplied by Natural Source Vending at Creekside Community Center.

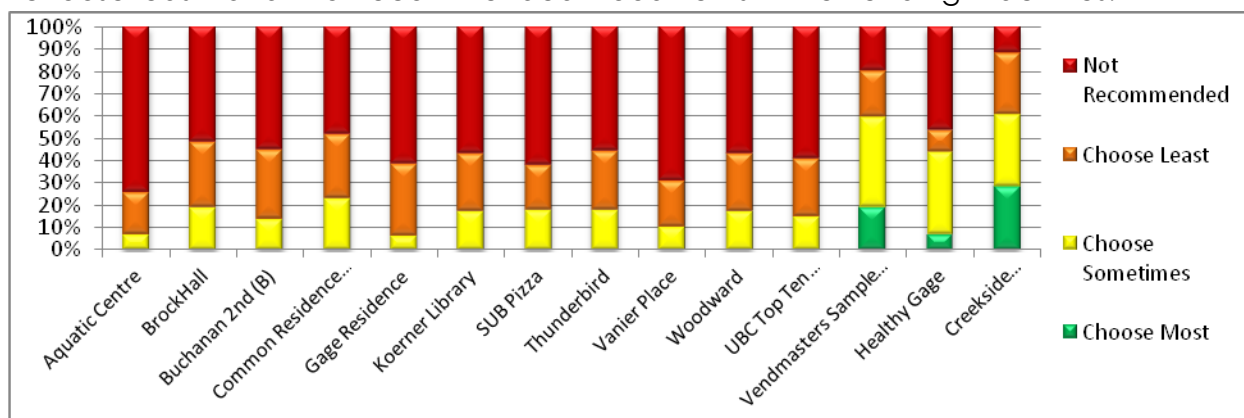
When carrying out the inventory, the students recorded the product name, size (grams), price, categorization as a “choose most”, “choose sometimes”, “choose least” and “not recommended” and whether the health Checkmark System was being used in the particular vending machine.

Upon auditing these vending machines, Group 1 found the following:

- On average, the top 10 vending machines contained no “choose most”, 15% “choose sometimes”, 26% “choose least, and 59% “not recommended” food items.
 - The Marine Drive vending machine had the top sales of any of the vending machines and it contained the highest percentage of food items falling outside of the category of “not recommended”.
 - The Aquatic Centre front vending machine had the highest amount of “not recommended” food items.

- The check mark system was used in only five machines: Koerner, Woodward, Thunderbird, Buchanan 2nd (B) and Common Residence (Marine Drive). Many of the vending machines using the system had food items for sale that were misrepresented by the check mark system. This is the result of VendMaster staff not updating the signage when new items are stocked in the vending machines. [Group 1, 2012]
- The pilot “healthy” vending machine at Gage Residence contained 7% “choose most” items, 36% “choose sometimes” items, 10% “choose least” items, and 47% “not recommended” items.
- The Creekside Community Center vending machine supplied by Natural Source Vending had 28% “choose most”, 32% “choose sometimes”, 28% “choose least” and 12% “not recommended,” which is the closest of the vending machines to meet the BC government’s guidelines.
- Additionally, Group 1 reviewed a partial product supply list supplied by VendMaster and found that it contained 19% “choose most”, 20% “choose sometimes”, 20% “choose least” and 41% “not recommended” food items.

The following table shows the distribution of “choose most”, “choose sometimes”, “choose least” and “not recommended” food items in the vending machines.



Considerations for changes to vending machines

Group 1 provided important information to keep in mind when considering making changes to campus vending machines. A summary of their findings follows.

- Items sold in vending machines are determined by how likely people are to purchase the foods (determined by taste and cost) and the ability of the food item to be stored in the vending machine (determined by shelf life and size of food product). [Group 1, 2012]
- Callaghan & Mandich (2010) found that among Ontario High School students, price, taste and value are the main deciding factors in vending machine

selection, even though students reported preferring healthy snacks such as yogurt, fruit and vegetables. [Group 1, 2012]

- There are over 70 vending machines located on the UBC campus and they are all under contract with VendMaster. VendMaster is a locally owned business that allows for great flexibility in the items stocked in their vending machines. (V. Wakefield, personal communication, 2012). [Group 1, 2012]
- Vending machines are a substantial financial contributor to UBC Food Service's economic sustainability. Therefore, it would be unacceptable to recommend major changes to the vending machines without complete understanding of the financial repercussions of these changes. [Group 1, 2012]
- UBC's holds a 10 year contract with VendMaster that will expire in 2017. Therefore, until 2017, UBC does not need to meet BC Vending Machine Guidelines. [Group 1, 2012]
- In 2017, when the VendMaster contract is set to be renewed, the new SUB building will be in place and the SUB vending machines will be managed by the AMS. This will change the factors considered in the new contract (V. Wakefield, personal communication, 2012). [Group 1, 2012]
- Group 1 identified the BC based Natural Source Vending as an alternative supplier to VendMaster. Natural Source Vending supplies the vending machine at Creekside Community Center. [Group 1, 2012]

Group 1 compiled recommendations for effective promotion of healthy foods in Vending Machines. Their suggestions follow.

- Lowering the price of healthy items and increasing the cost of unhealthy items to encourage the increased purchase of healthier food items. [Group 1, 2012]
- According to San Diego and Imperial Regional Nutrition Network (n.d.), colour-coding can be an effective communication tool. For example, red can indicate food items that are not recommended, yellow can indicate moderately acceptable food items and green can indicate healthy items. [Group 1, 2012]
- Food items placed at eye level often have increased sales. Therefore, Group 1 recommended placing healthy foods at eye level in the vending machines. [Group 1, 2012]
- Refrigerated vending machines, such as those that contain soda-pop, could be used to sell healthy snack such as yogurt and apples. [Group 1, 2012]

Snack foods at Campus Food Outlets

For the purpose of this project, Group 2 defined snack foods as "any item that is usually eaten between meals that can also be taken to go." [Group 2, 2012]

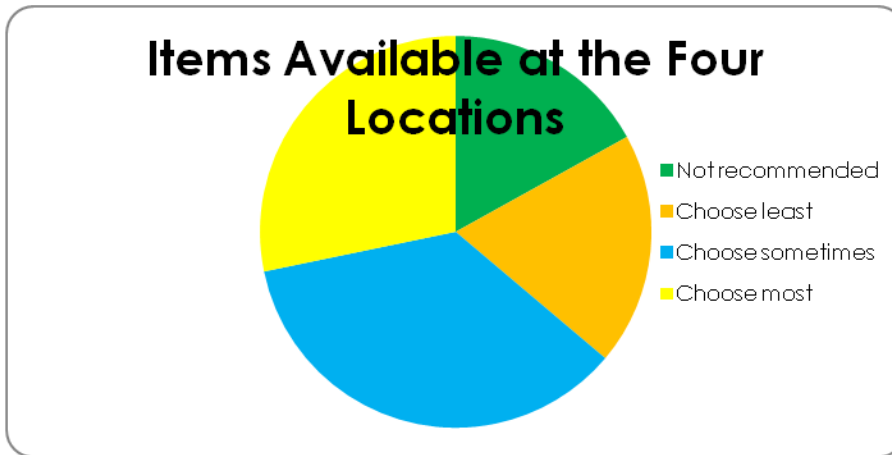
Inventory Results

Group 2 conducted an inventory of available snacks at The Loop Cafe, Ike's Cafe, Vanier Residence Dining Hall (Place Vanier) and Totem Park Residence Dining Hall (Totem Park) during the midmorning and midafternoon snack times. For each item, Group 2 collected the product name/type, the presence of nutritional information, available information on meeting special nutritional needs (vegan, gluten-free, lactose-free, organic) and the categorization of the product as per the BC guidelines ("choose most", "choose sometimes", "choose least" and "not recommended.") [Group 2, 2012]

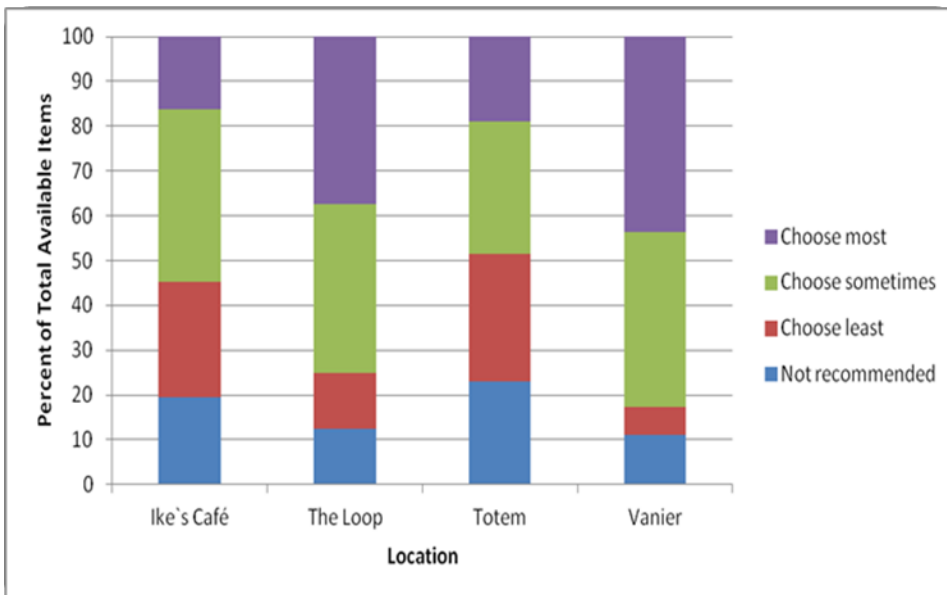
Group 2 took inventory of 169 items in their audit, with 60 from Place Vanier, 70 from Totem Park, 8 from The Loop Café, and 31 from Ike's Café. The methods of the inventory do not indicate how standardization of item selection was done. It appears some items, such as "chips," were marked as one item when it may represent a variety of options, while other items, such as "salad bar," were marked for each vegetable offered resulting in nine items. As such, the UBCFSP Coordinator felt vegetables and fruits are likely over represented in Group 2's findings. Group 2's inventory results are summarized below.

- Of the inventoried products, there were 61 (36%) baked goods; 20 (12%) fruits; 15 (9%) dairy products and alternatives such a yogurt, milk, cheese and soy milk; 14 (8%) vegetables; 9 (5%) cold deserts such as ice cream, pudding and jello; 8 (5%) granola or fruit bars; 7 (4%) non-milk drinks; 7 (4%) sandwiches or wraps; 6 (4%) soups; 5 (3%) condiments such as hummus, guacamole and peanut butter; 4 (2%) other foods such as calzone, sushi, samosa, and pepperoni sticks; 4 (2%) nuts, dried fruit or trail mix; 3 (2%) cereals; 3 (2%) starch based salads such as pasta salad and cous-cous salad; 2 (1%) chips; and one candy option.
- 107 (66%) of the items did not have nutritional information available. 35 (21%) had nutritional information, while for 28 (17%) items no answer was indicated by the group. Group 2 commented that when nutrition labeling was found, it was mainly on commercially packed foods.
- Group 2 found that in-house packaged foods typically lacked labels indicating if they were vegan, gluten-free, lactose-free or organic. Therefore, it is unknown if these items were present in larger numbers than represented below. [Group 2, 2012]
 - 28 (17%) were vegan, but 90 (53%) items did not provide enough information for the students to determine. 51 (30%) items were not vegan.
 - 32 (19%) of items were gluten-free, 56 (33%) were not and 81 (48%) did not have enough information to determine.
 - 24 (14%) of items were lactose-free, 41 (24%) were not lactose-free and 104 (62%) did not have enough information to determine.
 - 4 (2%) of items were organic, 63 (37%) were not organic and the remainder were undetermined, but assumed to be non-organic.

- On average, 28% of the snack food items inventoried were “choose most” items, 36% were “choose sometimes”, 19% were “choose least”, and 17% were “not recommended”. Group 2 represented this in the following graph. [Group 2, 2012]



- The Place Vanier Residence Dining hall and The Loop Café (items stocked by Place Vanier) had the highest number of “choose most” snack options available and the least “not recommended” options. The Totem Park Residence Dining hall and Ike’s Café (items stocked by Totem Park) had the fewest “choose most” and the most “not recommended” options available. The following graphic illustrates this. [Group 2, 2012]



Consumer Survey Results

Group 2 conducted a survey of consumers' satisfaction with the snack foods available at the four campus food outlets using convenience sampling. Most respondents were people who had chosen to eat their snack at the food outlet, which may have led to

under-representation of people who purchase snacks to-go. The following summarizes Group 2's survey results. [Group 2, 2012]

- Totem Park (19 surveys):
 - 47% of survey participants felt that there were not enough healthy snack options. Some specific comments were that snack items are “too sugary” and that “snacks are unhealthy and greasy.”
 - Of the respondents, 84% reported purchasing baked goods as snacks, 79% fruit, 74% beverages, and 74% wraps/sandwiches.
 - At Totem Park, respondents commonly reported avoiding cookies, cakes, chips, fruit and fried food as snacks and reported they would like to have a more varied fruit selection, more vegan snacks and protein rich snacks like nuts. Group 2 noted that at Totem Park, vegan and gluten-free baked goods are behind the counter in a freezer and students must specifically request them.
- Place Vanier (21 surveys):
 - 45% of respondents felt there were not enough healthy food options. One respondent said there was “too much junk food.”
 - The most commonly reported items being purchased were wraps/sandwiches, beverages, fruit, vegetables and baked-goods.
 - At Place Vanier, the most avoided purchases were fruit at the salad bar, pizza, burgers, donuts and pastries, while respondents wanted to see trail mix, dried fruit, more fruit and healthy snack bars offered.
- The Loop (15 surveys):
 - 79% of respondents felt there were enough healthy snack options.
 - Most purchased items were baked goods, wraps/sandwiches, and beverages.
 - Respondents reported avoiding chips (unhealthy), brownies (high calorie) and the salad bar (too expensive). Some respondents said they would like more salad choices, healthier wraps, dried fruit, and low-fat yogurt to be on offer.
- Ike's café (21 surveys):
 - 50% of respondents felt there were not enough healthy options. They said that items on offer were high in sugar and fat.
 - Respondents reported purchasing beverages most commonly, then wraps/sandwiches, followed by baked goods.
 - Most commonly avoided items were baked goods (fattening) and fruit (expensive), while respondents requested fruit salad, cheese and crackers and cheaper sandwiches.

Group 2 observed that there is a lack of awareness among consumers as to what snack options are available. This observation comes from comparing the foods available at

the four food outlets and the comments received on the surveys. For example, although the majority of students felt the food establishments offered enough healthy food options, on average only 28% of the inventoried snack items were “choose most” items. Group 2 pointed out that the response to this question is subject to the individual's definition of healthy, which could be determined relative to other available options or the environment where the snack item is being assessed, rather than on the actual healthiness of the food item itself. [Group 2, 2012]

Recommendations

UBC Food Services

- In the next year, increase the number of “choose most” food items in the vending machines across campus. [Group 1, 2012]
- Consider decreasing the price of “choose most” and “choose sometimes” vending machine items and increase the price of “choose least” and “not recommended” items. Ideally, this could be done in such a way as the gains would neutralize the losses. [Group 1, 2012]
- Work with VendMaster to increase the number of “choose most” food items offered in all 70 vending machines on the UBC campus. Over the next 5 years of the contract with VendMaster, monitor the “choose most” items being offered. If the number and quality of items does not improve, consider a different vending supplier that will better enable UBC to meet BC's guidelines. [Group 1, 2012]
- When considering the next vending machine contract, consider conducting a taste test of “choose most” and “choose sometimes” items offered by the different companies to help determine which items will be most acceptable to consumers. [Group 1, 2012]
- Increase the number of “choose most” food items at Ike's Café and Totem Park Residence Dining Hall. Some potential snack foods that could be added or increased at these locations include trail mix, ethnic snacks, fresh fruit, and granola bars. Over the next year, less profitable baked goods could be phased out and replaced with these items. [Group 2, 2012]
- Provide nutrition labeling for at least 50% of baked goods over the course of the next year. Labels should also indicate if the item is local, fair-trade or organic. This will help inform students' purchasing decisions. [Group 2, 2012]
- Increase the availability of gluten-free, vegan and lactose-free snack options at all food outlets. At Totem Park, these items should be displayed with labels so customers know they are available. [Group 2, 2012]
- Offering a UBC Food Service “snack of the week” could promote new and healthy snack items to consumers. [Group 2, 2012]

To the UBCFSP Coordinator

- In 2013, design a scenario in which students conduct a health inventory of the beverage vending machines. [Group 1, 2012]
- Work with UBC Food Services representatives to conduct an experiment to increase the prices of unhealthy snack items in vending machines and decrease the prices of the healthier items. [Group 1, 2012]
- Design a scenario in which students develop a consumer survey around the acceptability of the “choose most” and “choose sometimes” food items made available by VendMaster. [Group 1, 2012]
- Have future student groups focus on signage design and implementation for vending machines. [Group 1, 2012]
- Student groups can conduct product acceptability trials with UBC community members. [Group 1, 2012]
- Share the findings and recommendations of this report with the AMS so they can consider the findings when signing contracts with the vending machine companies for the new SUB. [Group 1, 2012]
- Next year’s students should conduct 50 surveys at each of the four food outlets and formulate questions around the labeling of snack foods. [Group 2, 2012]

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Scenario 2: Baseline Inventory- GHG Emissions of food products and action plan

Project Partner(s): UBC Food Services, Student Housing & Hospitality Services (SHHS)

Group(s): Group 3, Group 4, and Group 5

Full Paper Links:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_GHGEmissions_FoodProductsAndActionPlan_group3_NonMilkDairy_FINAL.pdf
- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_GHGEmissions_FoodProductsAndActionPlan_group4_Meat_FINAL.pdf
- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_GHGEmissions_FoodProductsAndActionPlan_group5_Produce_FINAL.pdf

Background

The food system is an important component of UBC's Climate Action Plan. To date GHG emissions from UBC's food system have not been estimated. This means that reduction targets have not been set and the relative magnitude of food system contributions to campus emissions cannot be compared to other sources of GHG emissions on campus.

Objective

In this scenario, three student groups were asked to create a GHG emissions inventory of a selection of dairy, meat and produce products used across campus. Students were also asked to develop recommendations aimed at reducing emissions, eliminating waste, and increasing the sustainability of the food system.

Central Findings

The following is a summary of the key findings presented in the three final reports of the student groups.

Food Systems Emissions

Group 3 reported a variety of estimates for how much human generated GHG emissions come from the food system. According to Lenzen (2001), total emissions from land and agricultural sources accounts for about 30% of overall human emissions. Eckard et al. (2010) reported that agriculture is responsible for producing 10-12% of global human generated GHG emissions, while Environment Canada (2011) reported that in Canada, agriculture accounts for 8% of human generated GHG emissions [Group 3, 2012]. According to Group 4, a Statistics Canada (2012) report says that meat is responsible for 23% of household food emissions while processed foods account for 21% [Group 4, 2012]. It should be noted that these estimates were calculated in different ways and may or may not be directly comparable.

In terms of food products, Group 5 reports that Anderson et al. (1999) and Foster et al. (2006) state that the more highly processed the product, the more GHGs it will emit.

Foster et al. (2006) explain that per kilogram of yield organic farming can use up to twice the land, which leads to increased emissions compared to conventional tomatoes. [Group 5, 2012]

Emissions Calculators

Emissions calculators are mathematical equations that attempt to calculate estimations of emissions for an individual or specific process based on factors added into the equation. According to the research done by Group 3, emissions calculators are not yet advanced enough to provide accurate estimations of GHG emissions. Calculators vary in the accuracy of the emission information they use, many do not explain the assumptions they make, often they do not take into account indirect emissions and some do not account for non-CO₂ emissions (Kim & Neff, 2009). [Group 3, 2012]

Campus initiatives

Group 3 reported several campus initiatives already underway that contribute to improving the sustainability of the UBC Food System. A summary is listed below.

- Sustainability Tracking Assessment and Rating System (STARS)- This sustainability reporting forum allows UBC to highlight its initiatives, provides some incentive to improve and compares the sustainability of different universities across North America.
- UBC Climate Action Plan- Launched in 2008, the plan set goals to reduce campus GHG emissions by 33% from 2007 levels by 2015 and to be emission neutral by 2050 (UBC-Campus Sustainability, 2010).
- UBC Sustainable Purchasing Guide- This guide outlines purchasing policy for the campus, including for food purchasing.
- Zero Waste Challenge- UBC Waste Management and the University Neighborhoods Association (UNA) aim to have a 70% reduction in waste by 2015. [Group 3, 2012]

About Greenhouse Gases (GHGs)

- Each greenhouse gas has a different climate warming capacity and each gas has a different lifetime that it can stay in the atmosphere. Each of these factors contributes to the level of impact that each GHG has on the climate. Some GHGs have a much higher warming potential than does carbon dioxide (CO₂). For example, nitrous oxide, released by ruminant animals such as cows, has 296 times the warming potential of CO₂ (Environmental Protection Agency, 2011) [Group 3, 2012]. CO₂ equivalents (CO₂e) are often used to express the total warming potential of a process that emits gases other than CO₂. The warming potential of each gas can be described in the equivalent amount of CO₂ it would take to reach the same warming potential. In this way, processes can be compared even if they emit different GHGs [Group 5, 2012].
- GHG emission factors are an estimate of the amount of GHGs a process or product emits per set unit. GHG emission factors are organized into three tiers depending on how specific the source information for the calculation is. Tier I emission factors are calculated with the least specific information source. These sources might include national averages for any given input. Tier II sources are more specific to the region, process or product. Tier III emissions factors are calculated specifically for the region, process or product under investigation.

These calculations are based on direct measures and detailed knowledge of all the inputs and outputs. Therefore, tier III emissions are the most specific and most accurate to the product (Environment Canada, 2005).

Methods

All three groups conveyed that the GHG emissions estimates they reported are generalized to the type of product under investigation rather than to the specific product. Product specific information is difficult to obtain because food companies do not easily know the origin of the many ingredients in the products they sell or they are not willing to share the information. Therefore, the students found tier I and tier II emission factors in the literature on which they based their calculations. In most cases, the emission factor estimates presented by the three groups are underestimates as the emissions factors obtained in the literature do not include certain steps or ingredients specific to the products ordered by UBC Food Services and distances travelled are typically gross underestimations.

The UBC Food Services Purchasing Manager provided the three groups with a velocity report summarizing the quantity of products purchased over the 2011 calendar year. From this list, food items were selected if an item was purchased in large quantity, if the item added to the variety of items selected for comparison's sake and/or if the item showed potential for substitution with lower GHG emission food items.

All groups expressed emissions as kg CO₂ or CO₂e so that items could be directly compared.

A Note on Transportation Emission Factors

Of the three groups, only Group 5 reported the transportation emission factor per kg of cargo carried by the semi-truck. As a result, the other teams reported very high transportation emissions factors as they assumed each kg of product was carried by an otherwise empty semi-truck.

Upon further analysis, the Morgan et al. (2010) paper appears to use an emission factor of about 0.084 g CO₂/km-kg. California's South Coast Air Quality Management district (2008) reported a similar emission factor of 0.08 g CO₂/kg-km, while CN North America's Rail Road (n.d.) reported an emission factor of 0.114 g CO₂e/kg-km based on 1995 Statistics Canada reports.

For air transportation, the emission factor of 0.001596 kg CO₂e/kg-km was taken from Foster (2006). [Group

For all three groups, the UBCFSP Coordinator re-calculated the emissions estimates to reflect the 0.08 g CO₂/kg-km emission factor for domestic truck transport and air transport noted above. As a result, all values presented in this summary are different from those presented in the student papers.

Dairy Findings

Background

The following summarizes Group 3's findings regarding GHG emissions in the dairy system.

- Environment Canada (2011) says that while livestock are responsible for a large amount of agricultural emissions, the dairy sector is responsible for very few of these emissions. According to Cederberg and Mattison (2000) and the Canadian Dairy Information Center (CDIC) (2009), the main source of GHG emissions in the dairy system comes from the cows' digestion process, excrement and manure management practices. [Group 3, 2012]
- Cederberg and Mattison (2000) say that in organic systems, the feed has more fiber and is less nutrient-dense than in conventional systems. This means the cows must eat and digest more and this results in a 10-15% increase in direct methane production. Organic systems do, however, offer other environmental benefits as they do not use chemical fertilizers, they are less intensive and help preserve biodiversity (Cederberg & Mattsson, 2000). [Group 3, 2012]
- Dairy products require refrigeration during transportation. This results in much higher GHG emission associated with transportation than does transportation of other goods (CDIC 2009). [Group 3, 2012]

Milk

The Canadian Dairy Commission regulates the amount of milk that is produced in Canada. The Commission exercises this supply management to help stabilize the market price of milk (CDIC, 2011). This benefits farmers with dependable income and consumers with a stable supply and price. In Canada, Saputo, Agropur and Parmalat are responsible for 80% of milk production (CDIC, 2011). [Group 3, 2012]

According to Food and Agriculture Organization of the United Nations (2010), the estimated global GHG emission factor for milk is 2.4 kg CO₂e /kg of milk, including processing and transportation. Verge et al. (2007) estimate the Canadian average emission factor to be 1.0 kg CO₂ /kg milk not including processing or transportation. [Group 3, 2012]

Yogurt

Yogurt is a dairy product made using a lacto-fermenting bacterial culture. Yogurt containers are usually made from the recyclable number 5 plastic. [Group 3, 2012]

Cheese

UBC Food Services purchases mostly semi-hard and semi-soft cheeses such as mozzarella and cheddar. However, UBC Food Services also purchases some goat and soy cheese. [Group 3, 2012]

- Canada produces most of its own cream cheese and has reduced imports by 45.5% since 2010 (CDIC, 2012). The provinces of Ontario and Quebec produce the most cheese. This cheese is for sale in the BC marketplace. [Group 3, 2012]
- Cheese production requires the addition of a bacterial culture to heated milk. Hard cheeses require more heating than soft cheese and are typically stored and cured for longer periods of time (Fellows, 2008). Harder cheeses have a higher overall GHG emissions associated with them because of increased processing and ripening times (Aguirre-Villegas et al., 2011). [Group 3, 2012]
- Goat cheese is produced in a similar way as cow's milk cheeses. British Columbia is home to 13.5% of Canada's goat farms (Agriculture and Agri-Food Canada, 2006) and is a producer of goat cheese. [Group 3, 2012]
- Hard cheeses are typically packaged in non-recyclable vacuum sealed plastic. Soft cheeses can be purchased in recyclable plastic tubs. [Group 3, 2012]

Soy Products

- According to Masuda and Goldsmith (2009), the top producers of soy are the United States, South America and China with only about 1.3% of the world's soy supply being grown in Canada. [Group 3, 2012]
- To produce soy alternative dairy products, the soy beans are cooked, ground and strained. The resulting liquid is sold as soy milk or further processed into yogurts or cheeses. [Group 3, 2012]

GHG Calculations

Group 3 reviewed eight categories of dairy products and alternatives: six soy products, one yogurt product, 12 cream cheeses, 11 soft cheeses, 14 semi-soft cheeses, 19 semi-hard cheese, seven hard cheeses and five goat cheeses.

GHG emissions were calculated using a formula, which included emissions factors for each of the steps required to bring the products from farm to UBC. The following points were taken into consideration. [Group 3, 2012]

- Production- The production factor included feed production, cow metabolism and manure management. The emissions factors were assumed to be the same for all conventional products. The secondary use of dairy cow meat was not factored into the equations. Group 3 made the assumption based on an Environment Canada (2011) report that goat products emit 70% of the GHGs emitted by cow products . [Group 3, 2012]
- Processing- the same emission factor was used across all products.
- Transportation- The same emission factor was used for all products. Domestically produced products were assumed to be transported by truck, while imported products were assumed to be transported by air. The total emissions were calculated for the number of kilometers traveled from the closest distributor to UBC. Information on transportation from farm to processor and from processor to distributor was not accessible and therefore was not included in the calculations.
 - There are large differences between products in the distances traveled from distributor to UBC. The distributors for cream cheese, soy and yogurt appear to be located between 400 and 5,000 kilometers away from UBC, while the distributors for other cheeses are located within 100 kilometers. [Group 3, 2012]

A list of the emissions factors used in the calculations and their sources are summarized in the following table.

Products	Production EF kg CO2e/kg	Source	Processing EF kg CO2e/kg	Source	Transportation EF kg CO2e/kg-km	Source
Soy	0.25	Carlsson-Kanyama & González, 2009	0.7	EWG, 2011	0.00008	Morgan et al (2011), SCAQM (2008)
Yogurt	0.59 0.79	EWG, 2011 EWG, 2011	0.7	EWG, 2011	0.00008	Morgan et al (2011), SCAQM (2008)
Cream Cheese	1.02	EWG, 2011	1.26	EWG, 2011	0.00008	Morgan et al (2011), SCAQM (2008)
Cheese (domestic)	1.02	EWG, 2011	1.26	EWG, 2011	0.00008	Morgan et al (2011), SCAQM (2008)
Cheese	1.02	EWG, 2011	1.26	EWG,	0.001596	DEFRA (2011)

(imported) Goat Cheese	0.71 EWG, 2011	1.26 EWG, 2011	2011 2011	0.00008 Morgan et al (2011), SCAQM (2008)
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Of the 63 products reviewed, the total calculated emissions for the products purchased over the 2011 year were 53,629.23 kg of CO₂e. The following table details the emissions factor per product.

From Group 3's work, it was determined that processing accounted for 54% of the emissions for these products, while production accounted for 44%, and transportation for 2% of emission.

Products	Annual Product Quantity (kg)	TOTAL kg CO ₂ e/kg pdt	TOTAL kg CO ₂ e for annual product quantity
Soy			
Mozzarella Soy Cheese (shredded)	19.4	1.33	25.84
Nacho Blend Soy Cheese shredded)		1.33	0.00
Original Soy Drink *	1196.0	1.33	1584.83
Vanilla Chai Soy Drink *	102.0	1.33	135.16
Fortified Strawberry Soy Drink *	1580.3	1.33	2094.02
Fortified Chocolate Soy Drink *	2370.4	1.33	3141.03
Yogurt			
Drinkable (various flavours)	1561.1	1.88	2930.20
Cream Cheese			
Herb & Garlic	61.0	2.67	162.71
Herb & Garlic (Port)	248.3	2.28	566.67
Light	206.4	2.28	471.05
Plain	47.2	2.28	107.73
Plain (tub)	16.8	2.28	38.35
Plain	137.0	2.28	312.75
Port	541.4	2.28	1235.47
Spreadable	115.7	2.28	264.00
Spreadable	144.9	2.28	330.71
Strawberry	43.3	2.28	98.80
Cheese (imported)		2.28	0.00
Soft Cheeses			
Bocconcini (30gr)	97.6	2.28	222.71
Bocconcini (90gr)	444.9	2.28	1015.13
Brie (double cream)	40.3	2.28	91.90
Brie (single cream)	11.2	2.29	25.68
Brie (triple cream)	4.7	2.28	10.70
Camembert (Danish) *	38.5	2.32	89.47
Curd (fresh)	3.2	2.32	7.30
Curd (poutine)	6.9	2.28	15.74
Mascarpone	73.6	2.28	167.88
Provolone	449.2	2.28	1026.06
Ricotta **	40.0	2.28	91.18
Semi-Soft			
Asiago	22.6	2.28	51.58
Blue (crumbled)	4.4	2.28	10.11
Blue (Rosenberg Mini)	2.0	2.28	4.56
Cambozola	20.5	2.28	46.80
Cheddar (medium)	31.5	2.57	81.08
Cheddar (medium, shredded)	31.5	2.64	83.29
Gorgonzola *	40.3	2.31	93.12
Gorgonzola (wheel) *	1.8	2.31	4.09
Harvarti (Jalapeno)	13.5	2.28	30.85
Monterey Jack (shredded)	5.3	2.28	11.98
Mozzarella (pizza)	1956.1	2.28	4463.30
Mozzarella (block)	2332.9	2.28	5324.85
Mozzarella (shredded)	3770.8	2.28	8606.99
Swiss (Canadian)	1670.7	2.28	3813.50
Semi-Hard			

Asiago (wheel)	5.8	2.28	13.19
BC Combo Box	186.4	2.29	426.26
Blue (Danish, wheel) *	146.9	2.31	339.62
Combination box	186.4	2.29	426.26
Cheddar (marble)	220.9	2.28	504.21
Cheddar (medium 32%)	2.4	2.28	5.41
Cheddar (medium, port)	0.0	2.28	0.00
Cheddar (mild)	278.4	2.28	635.33
Cheddar (Old, white)	47.5	2.28	108.42
Feta	609.3	2.28	1390.63
Feta (Cow milk) *	464.0	2.31	1073.47
Gouda (smoked)	119.9	2.28	273.68
Havarti	1026.8	2.28	2342.93
Monterey Jack (shredded)	364.5	2.28	831.93
Monterey Jack (w/hot pepper)	699.2	2.28	1595.34
Monterey Jack (white, block)	7.6	2.28	17.30
Monterey Jack (pizza mozzarella)	79.4	2.28	181.12
Pacific Pepper (½ Wheel)	2.8	2.29	6.51
Swiss (Gruyere) *	277.6	2.28	633.82
Hard			
Cheddar (old)	21.3	2.28	48.62
Grana Padano (1/8 wheel)	28.3	2.28	64.61
Parmesan (BC)	2.4	2.32	5.45
Parmesan (grated)	114.5	2.28	261.15
Parmesan (shredded)	1183.6	2.28	2701.59
Parmesan (value blend)	181.5	2.28	414.14
Parmesan Sardo *	7.2	2.31	16.65
Goat Cheese			
Camembert Goat Juliette	0.0	1.98	0.00
Cow blend	170.9	1.97	337.05
Crumbled	5.0	1.97	9.86
Feta (crumbled)	32.5	1.97	64.08
Romano Peccorino (sheep milk)	5.8	1.97	11.44

Group 3 was not able to calculate the emissions associated with packaging. However, according to their calculations, in 2011 the products studied accounted for 756,982 containers. [Group 3, 2012]

Additionally, Group 3 reminds the reader that GHG emissions are not the only indicator of sustainability. Although the dairy systems may have overall low emissions, it contributes to other environmental impacts such as water eutrophication. [Group 3, 2012]

Meat Findings

GHG Calculations

Group 4 reports that there are few sources in the literature that provide emissions factors for the various stages of meat product production. Additionally, they reported making telephone calls to production plants to enquire about GHG emissions and product origins. None of the companies were willing to share information with the students. For this reason, they were not able to establish an upper and lower limit for GHG emissions associated with each product. [Group 4, 2012]

Group 4 reviewed four chicken, three pork and two beef products. UBC Food Services spent \$143,500.00 on the nine categories of meat products in 2011. [Group 4, 2012]

- Transportation: Group 4 assumed all meat products were produced in Canada or the United States and transported by Light Duty Commercial Vehicles with

diesel engines. The transportation miles were calculated from processor to UBC [Group 4, 2012].

- **Production:** Feed production and waste disposal were factored into the emissions factors reported by (Hamerschlag & Venkat, 2011). The emission factor for processing did not vary across products, as the group could not find values specific to the different processing types for the different meat products. In the literature processing and production were often used interchangeably making it difficult for the group to distinguish between emission factors.
- **Packaging:** emissions factors were taken from Roy et al. (2011) who conducted a life cycle assessment in Japan [Group 4, 2012].

A list of the emissions factors used in the calculations and their sources are summarized in the following table.

Products	Production EF kg CO ₂ e/ kg	Processing EF kg CO ₂ e/ kg	Source	Packaging EF kg CO ₂ e/ kg	Source	Transport EF kg CO ₂ e/ kg-km	Source
Pork EF	4.62	1.52	Hamerschlag & Venkat, 2011	0.60	Roy et al., 2011	0.00008	Morgan et al., 2011; SCAQM, 2008
Beef EF	15.23	1.26		0.60			
Chicken EF	2.33	1.66		0.60			

Of the nine products reviewed, the total calculated emissions for the products purchased over the 2011 year were 115,163.15 kg of CO₂e. The following table details the emissions factor per product.

From Group 4's work, it was determined that processing accounted for 50% of the emissions for these products, while production accounted for 42%, packaging 8% and transportation emission contributions were negligible. In their study, Roy et al. (2011) also found that the majority of emissions for meat products came from the processing of the meat products. [Group 4, 2012]

Products	Annual Product Quantity (kg)	TOTAL kg CO ₂ e/kg pdt	TOTAL kg CO ₂ e for annual product quantity
SAUSAGE ITAL MINI CKD SKNLS	13.62	8.62	117.42
BEEF STK SALISBURY 3Z CKD FZN	29.00	18.63	540.29
BACON BIT CKD DCD 1/4IN FZN	51.40	6.31	324.34
PORK RIB PATTY CKD W/BBQ BNLS FZN	200.16	8.60	1721.40
MEATBALL OVEN BKD TRAD 1Z 160CT FZN	826.68	18.63	15401.40
CHICKEN BRST 4Z CORDON ROYALE FZN	274.04	6.62	1814.57
MEATBALL CHICK 150-156CT ORIENTAL TFC	959.04	6.62	6348.85
CHICKEN DCD 1/2IN 60WHT/40DK CKD FZN	2943.18	6.62	19483.85
CHICKEN FLT BRD CRUNCHY RUFFLED FZN ZTF	10485.00	6.62	69411.05

Produce

Group 5 provided the following information in support of their methods of calculating GHG emissions.

- According to Group 5, CO₂ emissions were the only emissions accounted for in this inventory. They felt this was a valid approach because Forster et al. (2006) and Roy et al. (2008) report that CO₂ is the main GHG to be considered in tomato production and processing. [Group 5, 2012]
- Group 5 did not include refrigeration-associated emissions in the transportation emission factor because in a study conducted by Carlsson-Kanyama (1998), it

was reported that associated emissions were quite small compared to the overall transportation emissions.

- Foster et al. (2006) explains that heated greenhouses produce 137 MJ/kg GHG emissions compared to open field cropping which 5 MJ/kg GHG emission due to high energy consumption. This indicates that the strategy of purchasing local produce may not always be the best strategy [Group 5, 2012].

Potatoes

Group 5 states that potatoes are a popular item on the UBC campus and are ordered in large volumes in a variety of forms [Group 5, 2012]. They are also easily grown in BC and other parts of North America. Together this makes potato products an important focus of the GHG emissions studies.

- Production: In their Seattle, Washington based study, Morgan et al (2010) found that potato production emitted 0.044 kg CO₂/kg potatoes. [Group 5, 2012]
- Processing: Most of the UBC potato products are processed by a company called McCains. Forest et al. (2006) showed that potatoes processed by the UK branch of McCains are responsible for 2.7 MJ of energy/kg of potatoes or 0.054 kg CO₂e/kg potatoes compared to 1.3 MJ /kg potatoes or 0.026 kg CO₂e/kg potatoes for unprocessed potatoes. The processing of McCain's French fries produces 0.233 kg CO₂e/kg fries. In 2011, UBC purchased a total of 1,283 kg of fries from McCains resulting in 297.7 kg of CO₂e. [Group 5, 2012]
- Transportation: Group 5 assumed all transportation was done by truck and the potatoes for UBC's potato products were grown in Seattle and processed at McCain's in Manitoba. [Group 5, 2012]

Tomatoes

According to Group 5, tomatoes are a very popular ingredient. UBC purchases a large amount of tomato products each year. [Group 5, 2012]

Karakaya & Ozilgen (2011) write that about 5% of tomatoes grown go to waste before they leave the farm. Of course, even more tomatoes go to waste as they make their way through processing and distribution to the consumer. This is not accounted for in the emissions estimations. [Group 5, 2012]

Group 5 looked at tomato paste, diced tomatoes, tomato juice and ketchup. The following is a summary of their findings.

- Production: Tomatoes are best stored in a refrigerated environment to help extend their shelf life. This is a contributor to GHG emissions associated with tomatoes. [Group 5, 2012]
- Production: Group 5 assumed production took place in Ontario, which is Canada's main location for tomato processing. They assumed that the tomatoes were grown in heated greenhouses. [Group 5, 2012]
- Processing: Karakaya & Ozilgen (2011) provided information on emissions factors associated with the processing of tomatoes in Turkey. North American emissions factors were not identified in the literature.
- Transportation: The transportation emission factor used was 62 g CO₂/tonne/km (European Chemical Industry Council, 2011). [Group 5, 2012]

Per unit, ketchup was the highest GHG emitter, however it is purchased in lower volume compared to other tomato products. Because diced tomatoes and tomato puree were consumed in the largest amounts, they contributed the most to emissions associated with tomato products purchased by UBC in 2011.

Apples

Group 5 found that it was difficult to conduct calculations for apples as they were not provided with the amount of fresh apples purchased by UBC in 2011. They also found that different units and measures not commonly used in North America were reported in the literature. Additionally, they had to make a lot of assumptions about where food ordered by UBC comes from, as the information was not readily accessible. [Group 5, 2012]

- Packaging/Storage: Foster et al (2006) report that apple storage can produce up to 0.0162 kg CO₂/kg stored apple and together with packaging the value is 0.0032 kg CO₂/kg apples.
- Transportation: In a German study, Foster et al (2006) showed that transporting apples from New Zealand to Germany produced 0.056 kg CO₂/kg apples, which was approximately equal to production emissions.

Group 5 suggests that it is best to purchase apples from as local a source as possible. Group 5 calculated the total emission factor for apples to be 0.08 kg CO₂/ kg. [Group 5, 2012]

Conclusions

The following points summarize Group 5's findings.

- Tomatoes were the most GHG intensive crop.
 - Agricultural production: 0.771 kg of CO₂/kg tomatoes.
 - Processing of tomato products increased the final product GHG emissions by an average of 35%.
 - Ketchup has an emission factor of 1.324 kg CO₂/ kg
 - Tomato juice: 1.122 kg CO₂ / kg
 - Diced tomatoes: 0.866 kg CO₂ / kg
 - Tomato paste has an emission factor of 0.860 kg CO₂ / kg.
- The emissions from the production of apples is nine times less than that of tomato production, with an emission factor of 0.080 kg CO₂ / kg fresh apples.
- Potatoes were rated as having an emission factor of 0.044 kg CO₂ / kg potatoes.
 - French-fries emission factor: 0.233 kg CO₂ / kg french-fries.
 - In 2011, french fries purchased contributed 297.7 kg of CO₂.
 - In 2011, whole potatoes purchased by UBC Food Services generated 0.121 kg of CO₂ emission.
- Total carbon emissions for processed tomato products purchased by UBC Food Services during 2011 are 2264 kg CO₂ emitted for tomato juice, 8346.0 kg CO₂ emitted for diced tomatoes, 7955 kg CO₂ emitted for tomato paste, and 1933 kg CO₂ emitted for ketchup.

Recommendations

To UBC Food Services:

- In accordance with UBC's Climate Action Plan to be carbon neutral by 2050, Group 3 recommends that UBC Food Services adopt the following GHG emission targets: Reduce emissions by 33% by 2015, 67% by 2020 and 100% by 2050. Group 3 recommends this be achieved by:
 - Sourcing as locally as possible:
 - Cheeses purchased from Agropur's Fine Cheese Division (Quebec), should be purchased from the Agropur subsidiary, Island Farms, which offers many similar cheeses.
 - Purchase an alternative to Yoplait's Yop, which is transported from a great distance.
 - Reduce or phase out the purchasing of drinkable yogurts from Quebec.
 - Using carbon mitigation
 - Purchase carbon offsets from one of the 14 Canadian retail vendors of offsets to achieve UBC's goal of being carbon neutral by 2050.
 - Reduce packaging
 - Bulk order dairy products to reduce packaging. Although the calculations in Group 3's report do not include the emissions generated by this packaging, the packaging is responsible for large amounts of emissions.
 - The group recommends using the number of containers as a baseline from which the amount can be reduced in the future. [Group 3, 2012]
- Reduce the amount of beef products ordered, as beef has the highest emission factor of any meat and therefore the greatest potential for impact among the meat products studies. [Group 4, 2012]
- Eliminate ordering products that are ordered in small amounts and must travel long distances. Find alternatives for such products. An example is chicken Italian sausage that is sourced from Chicago. [Group 4, 2012]
- Form partnerships with local growers to cut down on transportation emissions. [Group 5, 2012]
- Purchase fresh produce rather than pre-made products. [Group 5, 2012]

To the UBCFSP Coordinator:

- Consider writing future scenarios with the following topics:
 - Review the type of packaging currently used by a variety of dairy products that UBC Food Services orders. Determine emissions factors for these packaging types. Research alternative packaging options for dairy products. [Group 3, 2012]
 - Conduct a more detailed emissions analysis of the most purchased dairy items and include the packaging information. [Group 3, 2012]
 - Research emissions factors associated with processing of meat product as products differ greatly and little information was available. [Group 4, 2012]

- Focus on finding alternative items to the food items that are sourced from far away. [Group 4, 2012]
- Study the most highly purchased produce items/products. Do comprehensive life cycle assessments of these products to identify where GHG emissions can be reduced and to inform best purchasing practices. [Group 5, 2012]
- Conduct a life cycle assessment of organic produce grown in Canada to help fill the information gap on this type of produce [Group 5, 2012].

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Scenario 3: Baseline Inventory - Socially & Ecologically Responsible Food Options & Action Plan

Project Partner(s): UBC Food Service, Triple O's-Vancouver Campus

Group(s): Group 7

Full Paper Link:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_SociallyAndEcologicallyResponsibleFoodOptionsAndActionPlan_group7_FINAL.pdf

Background

UBC Food Service has made significant changes to the ecologically and socially responsible food options they provide across campus. In the past ten years, they have increased the amount of local, organic and fair-trade products they offer including produce from the UBC Farm and other BC food producers. They provided locally roasted, organic, Fair Trade, shade-grown coffee at all their outlets. In 2011, UBC became the first Fair Trade campus in Canada, meaning Food Services has committed to carrying Fair Trade products at their food outlets across campus. However, all of these progressive initiatives exclude campus food franchises. UBC Food Services does not have the authority to make policy decisions for these franchises. As a result, many food outlets on campus are not in step with the ecologically and socially responsible practices adopted by Food Services. [UBCFSP Scenarios 2012]

Objective

In this scenario, students were asked to conduct an inventory of the sustainable food items offered at the main franchises found across campus including Triple O's, Starbucks and Tim Horton's. Additionally, the group was asked to work with the Triple O's manager to develop an action plan to increase sustainable food options at her establishment.

Central Findings

Literature Review

Students were asked to conduct a literature review on food policies and evaluation methods used at other institutions. A summary of Group 7's findings follow.

- The University of McGill has developed a campus wide action plan called Vision 2020 which included the establishment of the Office of Sustainability in 2010, a sustainability policy, an \$800,000 annual Sustainability Project Fund and more. More information can be found at <http://www.mcgill.ca/sustainability/vision2020> (McGill University Sustainability-2, 2012).[Group 7, 2012]
 - McGill's Office of Sustainability is responsible for implementing on-campus composting with the use of an in-vessel composter capable of processing 62 tonnes of waste annually (McGill University Sustainability-1, 2012). McGill also has an active student organization, the Gorilla Composting Project, that works to educate the campus community on vermicomposting and

diversion of compostables from the landfill waste stream (McGill University Sustainability-1, 2012). [Group 7, 2012]

- Simon Fraser University (SFU) issued a Zero Waste report, which detailed recommendations for waste reduction on the campus. Currently, there are two on-campus compost collection units, but the composting itself is done off campus (Bowen et al. 2008). [Group 7, 2012]
- University of Oregon established its Office of Sustainability in 2007. The university has a Climate Action Plan aimed at reducing GHG emissions, and a Sustainability Center where students can exchange ideas and implement sustainability initiatives. Over 16 groups on campus work towards improving sustainability of the campus (University of Oregon, 2012). [Group 7, 2012]
- The City of Vancouver has implemented the Greenest City 2020 action plan with the intention of making the city as sustainable as possible (Robertson, et al., 2009). For information visit <http://vancouver.ca/greenestcity/>. The City of Vancouver aims to increase waste diversion from landfill to compost from 55% to 70% (City of Vancouver, 2011). The "One Day" website is part of the City's Climate Protection Program and provides information and tools for reduction of household energy use. Website: <http://vancouver.ca/oneday/> (City of Vancouver 2008).

Inventory of Socially and Ecologically Responsible Foods at UBC Franchises

The students conducted an inventory of the ecologically and socially responsible food items offered at two Starbucks, two Tim Horton's and the Triple O's on campus. The students recorded any food or beverage items that were vegan, used medication free meat, gluten free, made on campus, local (produced within BC), organic and Fair Trade. The results of their inventory follow. [Group 7, 2012]

The franchises have limited information available about the foods they offer. Group 7 found that franchise managers did not return phone calls and email inquiries, with the exception of Triple O's, which was a pre-arranged relationship. This limited the students' confidence in their inventory results. However, the inventory is reflective of what the average consumer would be able to discern about the foods on offer. [Group 7, 2012]

- No foods were identified for the categories of vegan, medication free, gluten-free, or made on campus.
- No items were identified at Tim Horton's
- Triple O's
 - BC sourced: chicken strips, chicken breasts, veggie burger, ice cream, French fries, tomatoes and cheese
 - Fair Trade: Coffee will be Fair Trade starting Fall 2012
- Starbucks
 - Organic: Yukon blend coffee
 - Fair Trade: Italian Roast blend coffee

Group 7 did not detail how they determined which products were produced in BC. If the Food Service definition of local products being those sourced within 150 miles of campus were applied, it is possible fewer items yet would be included in the list. Moreover the items included in the inventory, although supposedly locally produced,

are not otherwise ecologically and socially responsible food items. This indicates that franchises are overwhelmingly not offering socially and ecologically responsible food choices.

Waste Sorting Behavior

In consultation with Josie Midha, the Triple O's manager, Group 7 decided to focus on customer waste sorting behavior at Triple O's. Group 7 felt that by working with the on-campus franchises on sustainability initiatives there is potential to influence the wider food system off the UBC campus as well. [Group 7, 2012]

Literature Review

The students conducted a literature review to better define the context and need for improved waste sorting practices. [Group 7, 2012]

A summary of their results follows.

- According to The Conference Board of Canada (2011), a report conducted in 2007 ranked Canada last out of 17 countries for municipal waste generation with 894 kg of waster produced per capita per year. The waste generated per capita in Canada almost doubled between 1990 and 2006 (The Conference Board of Canada, 2011) [Group 7, 2012]
- Statistics Canada (2008) estimates that Canada generates 35 million tonnes of waste per year. Businesses, including fast food restaurants, account for 67% of the waste generated (Statistics Canada, 2008). Statistics Canada (2008) also reports that 78% of Canadian waste goes to landfills, but 50-60% is organic and could be diverted and composted. [Group 7, 2012]

Types of Packaging at Triple O's

With the help of Victoria Wakefield, the UBC Student Housing and Hospitality Services purchasing manager, the group was able to categorized each of Triple O's container types as compostable, recyclable or landfill. Additionally, they conducted a compostability test of some packaging materials in UBC's in-vessel composter. [Group 7, 2012]

A summary of the results follow.

- Non-compostable, non-recyclable containers: clear Caesar salad clamshell, Styrofoam poutine container with clear lid, and Styrofoam gravy container with lid. According to V. Wakefield (personal communication, 2012), these items are number 6- polystyrene plastic which is not easily recycled. According to J. Midha (personal communication, 2012), these items were chosen because they help maintain the correct temperature of the foods. Therefore, Group 7 feels the Caesar salad container has the largest potential for substitution.
 - V. Wakefield (personal communication, 2012) felt that it would make economic and logistic sense for Triple O's to collaborate with UBC Food Services in selecting and sourcing new container options.

- Compostable or recyclable: All other packaging items (a total of 20 categorized by the students).
- Unknown: The take-out French-fries container was undergoing a test in the in-vessel composter when the student report was submitted.

Waste Sorting Behavior Change using Signage

The group set out to test the effectiveness of signage in the diversion of waste streams at Triple O's. The group prepared signage with pictures of the Triple O's packaging to indicate what items should be composted, recycled and landfilled. The group conducted two observational surveys of how Triple-O customers sorted their waste. One survey was conducted before signage was put up and the other was conducted with the signage in place. A sample of the student's signage follows. [Group 7, 2012]

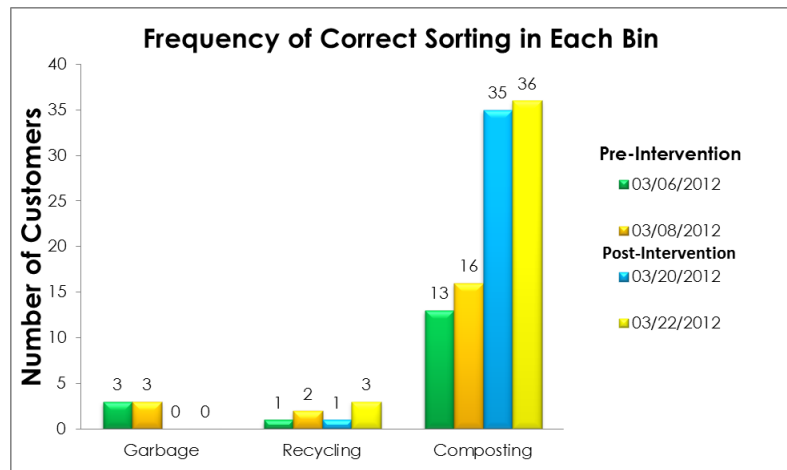


In each survey, a total of 120 observations were made. [Group 7, 2012]

A summary of the observations results follow:

- In the two pre-intervention observations, 77% and 80% of people observed incorrectly sorted one or more waste items. During the signage intervention the percentage reduced to 58%. The percentage of people correctly sorting their waste doubled during the intervention. [Group 7, 2012]

- The graphic was prepared by Group 7 to demonstrate the difference in sorting behavior before and after signage implementation. [Group 7, 2012]



- Group 7 made some key observations about people's waste sorting behavior.
- People tended to follow another person's lead. If one person incorrectly sorted a waste item, others were likely to mimic the behavior.
- When the landfill container was full, customers threw all their waste products into any bin that was not full.
- Paper products tended to fill the compost bin quickly. No paper recycling was available at Triple O's.

Recommendations

Triple O's

- Implement the colour-coded, Triple O's packaging specific signage created for the disposal units and restaurant tabletops. Samples of proposed signage has been provided by the students and can be found in their student report on the SEEDS website. [Group 7, 2012]
- If Triple O's designs their own signage, make the frequently utilized Triple O's packaging the most prominent on the signs. Use both visual examples and explanatory labels.
- Incorporate a paper recycling bin as a component of the waste disposal units present at Triple O's. This will help avoid overflow of the compost bins.
- Replace the poutine, gravy, and clamshell salad containers currently being utilized at Triple O's with recyclable or compostable alternatives.
- Increase the size of ketchup containers as many customers use more than one container per meal.

To the UBCFSP Coordinator

- In 2013, extend this project to other franchises such as Tim Horton's to help them create their own packaging-specific signage for waste disposal units. It would be helpful to the students to establish relationships with the franchises prior to the start of the project.

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Scenario 4: Baseline Inventory- Aboriginal & ethnic foods on campus

Project Partner(s): UBC Food Services

Group(s): Group 8

Full Paper Link:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_AboriginalAndEthnicFoodsOnCampus_group8_FINAL.pdf

Background

In the UBC Plan "Place and Promise," UBC announced its commitment to increasing Aboriginal engagement and intercultural understanding (UBC, 2012). UBC Food Services would like to explore ways that food can be used to advance intercultural exchange and understanding. The original scenario assignment was to conduct an inventory of the ethnic foods offered across campus with a special focus on Aboriginal food items. However, Group 8 decided to focus solely on the Aboriginal aspect of the assignment, a choice that was supported by the UBCFSP Coordinator and the project partner. At present, there is little interaction between UBC Food Services and the Aboriginal Community on campus. As such, a situation assessment aimed at gathering information about what is already happening on campus with regard to Aboriginal food and looking at the possibilities for engagement was determined to be an appropriate starting place.

Objective

To define and inventory the Aboriginal foods currently offered on campus and to better understand the opportunities that exist for learning about Aboriginal cultures through food.

Central Findings

Literature Review

The students began by conducting a literature review to better understand the Aboriginal context for the project. The students' findings are summarized here.

- Freeman (2006) explains that food is a key way that humans interact. Wilk (1999) acknowledges that important aspects of culture are transmitted through food traditions and says that ethnic cooking and ingredients often reflect historical and current interactions with other cultures as well as economic status. Mintz and DuBois (2002) say that food is important to cultural identity and beliefs. [Group 8, 2012]
- According to Elliott and Jayatilaka (2010), Vancouver's Aboriginal community is faced with many food system challenges, especially when it comes to food

security and food sovereignty. Elliott and Jayatilaka (2010) also say that Aboriginal foods are wild foods and are becoming increasingly scarce due to deforestation and environmental degradation. In the city context, access to traditional foods is even more limited. Additionally, in BC as in much of Canada, traditional knowledge, including that of food, suffered terrible losses when the population was forced through residential schools. Altieri and Toledo (2011) write that these are common issues faced by many indigenous minorities after they have been colonized. [Group 8, 2012]

- Nadasdy (2002) says that Western culture views food as a commodity. That is, food can be purchased and becomes the property of the individual once it is purchased. According to Denise Sparrow (personal communication, 2012), an Aboriginal community member, Aboriginal people view food as communal. Ross and Pickering (2002) also discuss this cultural view. [Group 8, 2012]
- Mintz and DuBois (2002) write that modern day agriculture displaces indigenous food systems and removes indigenous peoples from their land. Industrial and monoculture food production result in chemical fertilizers and pesticides leaching into the environment and polluting natural ecosystems on which indigenous peoples rely (Mintz and DuBois, 2002). Flowing from this idea, it makes sense that Altieri and Toledo (2011) claim that incorporating indigenous food sources from local sustainable sources into the food system can result in environmental benefits. [Group 8, 2012]

The Aboriginal Food System on Campus

For the purpose of this project, Group 8 identified the UBC Aboriginal community to include UBC First Nation students; Aboriginal community elders; the staff, volunteers and members of Urban Aboriginal Community Kitchen Garden at the UBC Farm; and staff and community members at the UBC Long House. [Group 8, 2012]

Group 8 identified three key research areas, which are outlined below.

Defining Aboriginal Food

To better understand what Aboriginal food is, Group 8 carried out three key informant interviews with Hannah Lewis from the UBC Institute for Aboriginal Health, Rick Ouellet from the UBC First Nations Long House, and Denise Sparrow from the Salishan Catering service. The following is a summary of some key points made in these interviews. [Group 8, 2012]

- For Aboriginal people, there is a deep connection between body, mind and spirit. Additionally, an individual's health status is directly linked to the wider community and environment. Because of a deep connection to the land, food is central to health and healing.

- There are no dishes that characterize Aboriginal foods. Aboriginal foods are changing and evolving. They should not be seen as static and they should not be romanticized.
- The origin of the food is very important to Aboriginal people and sustainability is an essential concept. Culturally, Aboriginal peoples only consume what is needed for the community. For Aboriginal people, food is communal.
- Aboriginal knowledge on food is limited. In many cases, only elders hold the knowledge and they are often unwilling to share it because they do not want it to be misrepresented or exploited (D. Sparrow, personal communication, 2012).
- Many Aboriginal ingredients are seasonal and not available out of season (D. Sparrow, personal communication, 2012).
- Group 8 reports that some Aboriginal plant foods may be poisonous if collected in the wrong season or if prepared incorrectly (D. Sparrow, personal communication, 2012).

Availability of Aboriginal foods on campus

The students researched Aboriginal food related activities on the UBC campus. The following summarizes their findings. [Group 8, 2012]

- Vancouver Native Health Society Garden Project at the UBC Farm. At the UBC Farm, community garden lunches are prepared and held by Aboriginal community members from around Vancouver and especially from the Downtown East Side. Community members come together to prepare meals using Aboriginal ingredients and others grown in the garden and brought to the meal. The garden is for exclusive use of the community kitchen lunch. [Group 8, 2012]
- Feast Bowl held by the Institute for Aboriginal Health at the UBC First Nations Longhouse. The event is held once a month at the First Nations Long House and Aboriginal dishes are prepared by volunteers and served to community members. Community members are provided health resources and information at the monthly event. [Group 8, 2012]

The Aboriginal Community's Voice

Group 8 set out to understand the Aboriginal community's response to the question "Should Aboriginal food be incorporated into the main stream UBC food system? And if so, how?" To assess this, the students attended the "Feast Bowl" where they presented a question board to the community with three questions. Community members were invited to write their answers on a post-it note and attach the note to the board below the question. Community members were also able to approach the students to discuss the question if they liked. This methodology was suggested by Hannah Lewis and Rick

Ouellet who considered it a culturally appropriate way of interacting with the Aboriginal community. [Group 8, 2012]

The students found that the community appeared to be interested in offering their responses on the post-its and thus felt the method of interaction was successful. [Group 8, 2012]

Group 8 asked the following questions:

- “Do you think food should be used as a way for UBC’s non-Aboriginal community to learn about the First Nations culture? Why or why not?”
- “In your opinion would it be appropriate for UBC Food Services to have Aboriginal food options available to the wider UBC population as a means for intercultural exchange & learning of First Nations culture?”
- “What would it look like to have the non-Aboriginal community gain an understanding of First Nations culture through the medium of food?”
- “What are the appropriate steps you’d recommend they (i.e. UBC Food Services) take when integrating Aboriginal food into the UBC food system?” [Group 8, 2012]

The results of the question board are summarized here.

- More than half of the respondents felt that Aboriginal foods should be incorporated into the wider campus food system if it is done in a culturally appropriate way. [Group 8, 2012]
- Respondents indicated that UBC Food Services could transform Aboriginal foods into new types of dishes. [Group 8, 2012]
- Some respondents voiced concern that Aboriginal foods would be viewed as a commodity rather than a vehicle for understanding Aboriginal culture if it is sold by UBC Food Services as UBC Food Services is primarily a business formulated to make profit. [Group 8, 2012]
- Respondents indicated that there should be increased Aboriginal involvement with existing services. [Group 8, 2012]

UBC Food Services

Group 8 also met with the UBC Food Service representatives. They noted that the main focus of the interview was on the logistics of how Aboriginal foods could be incorporated into the menu. The discussion included concerns of cost for ingredients, ingredient sources and the need for recipes. [Group 8, 2012]

Risk assessment

In synthesizing the information collected through their research, Group 8 felt that conflict could arise between UBC Food Services and the Aboriginal community due to

differing views of food. Fundamentally, UBC Food Services views food as a commodity, while the Aboriginal community views it as communal and a source of healing.

To avoid these risks, Group 8 recommends that the Aboriginal community be involved in the process to include Aboriginal foods in the UBC Food Services menu offerings to ensure culturally respectful choices are made.

Overall, Group 8 sees the potential of a partnership between UBC Food Services and the Aboriginal community as a way to engage in true collaboration, which could result in real advances in sustainability by incorporating Aboriginal ecological knowledge into the extensive workings of the UBC food system, a deepened First Nations involvement at UBC and cultural knowledge exchange. [Group 8, 2012]

Future Stakeholders

Group 8 reported that the key stakeholders who should be considered in this scenario include campus Aboriginal community, UBC Food Services, AMS Food and Beverage Department, the First Nations Longhouse at UBC, Center for Sustainable Food Systems at UBC Farm, the Urban Aboriginal Community Kitchen Garden team, and UBC Waste Management. The wider campus community should also be considered a stakeholder. [Group 8, 2012]

Recommendations

To UBC Food Services:

- Consider the Aboriginal community as a partner, rather than a consultant in the process of considering incorporating Aboriginal foods into the wider UBC food system.
- Approach the Aboriginal community in a culturally appropriate way.
- Establish a common vision with the Aboriginal community for how Aboriginal foods can be incorporated into the UBC Food Service menu offerings. This could be done by establishing a committee and holding meetings. This committee can also help guide culturally appropriate ways to interact with the Aboriginal community. Group 8 recommends the committee be composed of at least 50% Aboriginal community members.
- UBC Food Services could consider inviting the Musqueam people specifically to be a part of the proposed partnership. Potentially, Aboriginal food ingredients could be grown or collected in the Musqueam territory on which UBC is located.
- Aboriginal cooking classes could be offered to teach chefs and other community members how to properly harvest and prepare Aboriginal foods.
- If Aboriginal foods are incorporated into UBC Food Service menu offerings, they could potentially be incorporated at an event. D. Sparrow (personal communication, 2012) recommended administering a survey to evaluate the success of the menu offering.

To the UBCFSP Coordinator

- Design a scenario to facilitate discussion between UBC Food Services and members of the Aboriginal community in how to move forward.

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Scenario 5: Baseline Survey of the UBC Food System - Public Opinion to Inform Food System Targets

Project Partner(s): UBC Food Service, AMS Food and Beverage Department

Group(s): Group 9

Full Paper Link:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_PublicOpinionToInformFoodSystemTargets_Group9_FINAL.pdf

Background

As a component of the baseline inventory of the UCB foods, the UBCFSP and project partners wanted to include an inventory of the UBC campus community's opinions and behaviors in relation to the campus food system. Stakeholders and project facilitators decided that a survey would help capture current attitudes, knowledge and behaviours of campus community members. The UBCFSP Vision for a Sustainable Food System was used to develop a list of indicators to be measured by the survey. Other indicators were derived from wanting to know how effective current campus initiatives are from the community's perspective.

Objective

The students were asked to conduct a campus-wide survey to obtain baseline data on the campus community's knowledge, attitudes and practices in the area of a sustainable food system.

Survey Methods

Group 9 aimed to gather 1,000 participants using convenience sampling. The survey contained 59 questions. The methods of recruitment are explained below.

- Recruiting was done by poster, in-person and electronically.
 - Posters were placed in locations with high student traffic including the SUB, the UBC Bookstore, Koerner Library, Irving K. Barber Learning Centre, Woodward Library, and the UBC Residences (Walter H. Gage, Place Vanier, Totem Park and Marine Drive). A quick response code was included on the posters to allow people with smart phones to electronically access the survey.
 - In-person recruiting was done in non-faculty buildings including the UBC Bookstore, the SUB, specific classrooms, Irving, Koerner and Woodward libraries, study areas and the UBC Residence Commons Block.
 - A Facebook page was prepared to advertise the survey. The LFS Undergraduate Society Blog also advertised the survey.
 - Group 9 members announced the survey on the Vista discussion boards of their various classes, which were mostly Faculty of Land and Food Systems (FLFS) courses.
 - Group 9 wanted to email the survey through the UBC listserv but was not able to. [Group 9, 2012]
- The survey was offered online via the Enterprise Feedback Management (EFM) program, which is a UBC approved survey tool. The online survey was available

for a two-week period. A longer period may have helped increase response rates. [Group 9, 2012]

- Hardcopies of surveys were hand-tabulated and entered into Microsoft Excel. [Group 9, 2012]
- All survey respondents were entered for the chance to win a gift card to the UBC Bookstore. [Group 9, 2012]

Central Findings

Survey Demographics

Group 9 was successful in recruiting 413 survey participants. [Group 9, 2012]

Upon review of the survey data, the UBCFSP Coordinator noted that 14 participants did not answer any questions in the survey and therefore eliminated these respondents from the analysis of the data. Therefore, the numbers presented in this summary report differ from the numbers presented by Group 9 in their student report.

Of the 398 respondents to the survey, 283 were online participants and 115 were in-person participants. Because not every respondent answered each question, the total response rate for each question is noted next to the percentage figure as (N=x).

The survey respondents' demographic information is summarized below.

- 89.5% of respondents (N=398) were students.
- 31% of respondents (N=398) were from the Faculty of Land and Food Systems (FLFS). This percentage differed between online (N=283) where 37% were FLFS and the in-person (N=115) surveys where only 17% were from FLFS. All other faculties had equal percentages of respondents for the online and in-person surveys. Group 9 felt that the use of Vista and Facebook biased the online responders to FLFS. Group 9 notes that using the UBC listserv to send the electronic survey could have helped eliminate bias. [Group 9, 2012]
- 22% of respondents (N=398) lived on campus.
- 75% of respondents (N=396) reported eating on campus once a week or more.
- When asked to note which two campus food outlets they ate at most often (N=398), 78% of respondents said the SUB, 35% Tim Horton's, 33% Starbucks, 18% Ike's café, 13% food outlets in the Village, and all other options were under 10% response rate.
- Overwhelmingly, respondents (N=396) said that location (35%) and price (32%) were the most important reasons for choosing these establishments, ahead of taste (16%), nutrition (11%), speed of service (2%) and other reasons (4%).

To Go

Students were asked about their use of re-usable containers on campus. A summary of the survey responses follows.

- 51% of respondents (N=397) reported that they have brought their own mug to campus at least once, while another 39% reported that they never have. Of those who reported bringing their own mugs (N=204), 25% of respondents said they bring their cup every day, another 26% once a week, 26% at least once a month, and 23% once a semester or less.
- 71% of respondents (N=396) said they have never brought their own to-go container for food.

- 74% of respondents (N=383) knew that campus food outlets offer discounts for bringing your own mug, but only 43% (N=372) knew that campus outlets also offer discounts for bringing your own food container. Only 35% of respondents (N=191) reported bringing their own mug to get the discount.
- 26% of respondents (N=381) reported knowing about the Eco-to-go reusable container program launched in 2011 and 5% of respondents said they were members of the program. [Group 9 , 2012]

Dietary Choices and Menu Items

The survey included questions on the participants' dietary choices.

- 8.5% of respondents (N=375) reported being vegetarian or vegan, yet 22% (N=376) reported choosing vegetarian meal options most of the time and another 52% some of the time. Many respondents (N=356) reported this was mostly for health reasons (33%) and taste preferences (21%). Only 2% of respondents (N=346) reported being vegan, but 42% of respondents (N=348) reported choosing vegan foods at least some of the time.
- 97% of participants (N=397) reported knowing what organic foods were; however 36% (N=389) were not aware of organic foods on campus, and 52% (N=384) reported having never bought organic foods on campus.

Waste

The survey asked participants asked about their waste sorting behavior.

- Almost all respondents (N=395) knew what recycling was. 20% (N=380) found it inconvenient to recycle on campus. Of the 378 respondents, 41% of respondents said they recycle plastic cutlery less than once a semester. When asked to indicate why they did not recycle plastic cutlery, 40% of respondents (N=398) said it is not recyclable, 40% did not know where to recycle it, 33% said it was not convenient to recycle them, while only 4% said it was not important to them to recycle.
- 45% of respondents (N=391) reported that they almost never recycle plastic products such as sushi trays on campus.
- Only 5% of respondents (N=397) did not know what composting is. 22% (N=375) of respondents were not aware of any composting bins on campus and 19% of respondents (N=306) reported not using composting bins on campus. 38% of respondents (N=261) did not feel composting was convenient on the UBC campus. When asked why they did not compost, 40% (N=398) said it was not convenient to compost, 24% (N=398) said they did not know which items could be composted, and 23% (N=398) said they did not know where to put compostable items.
- When the 398 respondents were asked which items could be composted, 35% of respondents falsely thought chopsticks were compostable. Only 33% thought stir sticks were compostable. 51% knew paper bags were compostable, while 61% knew paper napkins, 4% bones, and 60% tea bags were compostable. 6% of respondents thought to-go cup lids, 2% flatware, and 27% to-go cups were compostable. It should be noted that some to-go coffee cups are compostable on campus.

- Only 5% of respondents (N=391) believed that it does not matter which bin (garbage, recycling or compost) they put an item in because all the bins will be sorted later anyway.

Campus Events

The survey asked participants questions about food related events held on campus.

- 55% of respondents (N=397) were aware of campus food-related events such as Meet Your Maker, the Blueberry Festival, the Apple Festival, FarmAde, and Fair Trade Week. 29% (N=391) had attended an event.
- 24% (N=392) of respondents had purchased food from the UBC Farm. 38% (N=393) were aware of the Saturday UBC Farm Markets and 43% (N=395) of the Wednesday Farm Markets.

Group 9 felt that this indicates that improved advertising for events may be helpful in awareness building.

Sustainable Food Products

When asked about the frequency of purchasing Fair Trade, organic, and local products, the respondents answered as follows.

- 32% (N=389) reported never purchasing Fair Trade products, 33% were unsure and only 16% said more than once a week.
- 36% (N=392) reported never purchasing organic products, 30% were unsure, 14% replied once a week or more.
- 26% (N=390) reported never purchasing local products, 39% were unsure, 13% said once a week or more.
- 68% (N=384) of participants said they were more likely to purchase food from an outlet that uses produce from the UBC Farm.

Group 9 felt this indicates that there is a knowledge gap and that signage and labels may help fill this gap.

Food Information

The survey asked participants about their interest in increased information availability related to foods on campus.

- When asked if they were interested in more information about the food they purchase on campus, 59% of respondents (N=395) wanted to know more about how foods served on campus were produced. 51% (N=398) wanted more nutrition information, 43% (N=398) information on origin, 38% (N=398) where the food was prepared, 40% (N=398) organic, and 17% (N=398) cultural information and 34% (N=398) Fair Trade, 17% (N=398) vegan, 21% (N=398) vegetarian.
- When asked how information about foods on campus could be shared, 44% (N=398) of respondents replied that they thought table tents, brochures, or displays located at the site of food purchase would be among the best options. 47% thought product labels would be among the best. 47% wanted online resources. Between 20-24% of respondents were in favor of each of classroom lectures, campus events, and newspapers as the best methods. Less than 15% thought tours of the UBC Farm, talking to farmers and study groups would be best.

- Respondents were most interested in learning about the campus food system through online sources. Group 9 notes that there are already several online sources that house information about the UBC food system.
- Only 27% of respondents (N=388) had heard of the UBC Food System project. Based on the high response from FLFS, this is likely an over estimate for the campus.

Targets

Group 9 recommended the following targets based on the survey data collected. These targets can be monitored through the annual administration of this survey.

- By 2022, there will be no cross contamination of the garbage, composting, and recycling post-consumer waste streams. This can be accomplished with the help of UBC Waste Management by implementing effective labels and signage and increasing the number of recycling and compost bins across campus.
- By 2017, the UBC campus community will have increased knowledge with respect to organic, local, and fair-trade food. This can be accomplished with the help of UBC Food Services and the AMS Food and Beverage Department through improved use of labels detailing where food is grown, how it is grown and how it is prepared.
- By 2017, there will be increased attendance of food-related campus events. This can be made possible by advertisement done by Campus Sustainability in lecture rooms, brochures, guest speakers, posters, and emails from UBC and web pages/blogs on the internet.
- By 2017, more members of the campus community will use reusable containers. This can be made possible through advertisement by Campus Sustainability and through food outlet discounts and Eco-to-go program.
- By 2020, there will be increased purchasing of produce from UBC Farm. [Group 9, 2012]

Recommendations

To UBC Food Services

- Improve waste stream signage to decrease contamination. [Group 9, 2012]
- Increase advertising for campus events and sustainability initiatives. [Group 9, 2012]
- Implement labeling for sustainable food items so that consumers know why the items are a better choice. [Group 9, 2012]
- Increase advertising for the Eco-to-go program. [Group 9, 2012]
- Group 9 felt that this indicates that improved advertising for events may be helpful in awareness building.

To UBCFSP Coordinator

- Shorten the survey to encourage more responses. Delete questions or consider breaking the survey into multiple shorter surveys. [Group 9, 2012]

- Reissue the survey with the aim of getting 1,000 participants. Try to send the survey through the UBC listserv to decrease bias in survey responses. [Group 9, 2012]
- Set up a booth at the SUB and the UBC Bookstore to help gather survey participants. Group 9 recommends conducting in-person surveys on Tuesdays and Wednesdays at noon, as these are the high traffic times. [Group 9, 2012]
- The survey should be kept live for more than two weeks to help encourage increased participation. [Group 9, 2012]
- Work with UBC Waste Management, UBC Food Services and AMS Food and Beverage Department to increase the number and visibility of composting units on campus.

Scenario 6: Campus Greenscaping- Management of the First Rooftop Garden at UBC-Vancouver

Project Partner(s): Alma Mater Society (AMS), AMS Food and Beverage Department (AMSFBD), and Sprouts

Group(s): Group 10 & Group 11

Full Paper Links:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_CampusGreenscapingManagementFirstRooftopGardenAtUBC_Group10_FINAL.pdf
- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/BaselineInventory_UBCFoodSystem_CampusGreenscapingManagementFirstRooftopGardenAtUBC_Group11_FINAL.pdf

Background

The Alma Mater Society (AMS) is breaking ground for a New Student Union Building (SUB) that aims to have the highest green building rating and “Leadership in Energy and Environmental Design” or LEED certification in North America and that will be an icon of sustainable design and responsible operation. In 2010, the AMS challenged LFS 450 students to put forward a proposed design for the inclusion of a rooftop garden for the New SUB. Based on the LFS 450 students’ recommendations, a rooftop garden space will be included in the new building. Sprouts, the student run café in the SUB, and the AMS Food and Beverage Department would potentially be the main recipients of the garden’s produce. However, neither organization is prepared to take on the management of the garden.

Therefore, the AMS is looking for alternative management solutions. The AMS would like to have a management plan in place before the garden is built to help ensure the success of the garden. [UBCFSP Scenarios 2012]

Objective

The AMS has requested that the student groups research, develop and prepare recommendations for two management strategies for the new rooftop garden: the first, a small non-profit business; and the second a community garden style plan.

Central Findings

Literature Review

Each group conducted a literature review on management models. A summary of their results follows.

Functions of Management

Group 10 introduced Kreitner's eight functions of small-business management. Kreitner (1998) noted that business management is about working with others to achieve organizational objectives using limited resources. These eight functions are planning, decision making, organizing, staffing, communicating, motivating, leading, and supervising (Kreitner, 1998). Group 10 felt these are important functions of the management team for the garden and that proper management of the AMS's SUB Rooftop Garden will be important to the functioning of the garden including the quantity and quality of food produced. [Group 10, 2012]

Potential Benefits of a Rooftop Garden

Group 10 described the rooftop garden project as highly relevant in today's modern urban context. The following summarizes some of the proposed benefits of rooftop gardens.

- Rooftop gardens can produce fresh, local, healthy produce [Group 10, 2012]. The SUB rooftop garden will supply a very small amount of produce to the campus food system [Group 11, 2012].
- The garden can serve as a community hub [Group 11, 2012]. Rooftop gardens can play a role in reconnecting people with food production. The garden can get students involved in the campus food system and can serve to educate the community about food production [Group 10, 2012].
- Sewage system overflow is a common problem in North America due to rainwater drainage. According to Liu, et al. (2002), rooftop gardens can help absorb rainwater and decrease sewer overflows. [Group 10, 2012]
- Rooftop gardens can help insulate a building resulting in reduced heating and air-conditioning costs. [Group 11, 2012]
- The New-SUB rooftop garden will serve as a model for future rooftop gardens on campus. [Group 10, 2012]

Key informant interviews

Each group conducted interviews with key stakeholder groups including their project partners. The following summary is of the interview information that applies generally to the scenario.

AMS updates

- An important development to note is that the AMS had originally planned for the rooftop garden to be about 500 square meters (sq. mtrs.), however over the course of the previous semester it was decided the actual growing space would be reduced to about 150 sq. mtrs. or about 1,500 square feet (Longhurst personal communication, 2012) [Group 10 & 11, 2012]. In practice, this means lower production and potentially less time needed to manage the garden.
- Group 11 found that the AMS has six main goals for the garden space. These goals are 1) to be student focused; 2) to encourage peer-to-peer education; 3) to be a place of community building between student and non-student community members; 4) to promote food system sustainability to non-garden community members; 5) to increase the sustainability of the UBC food system; and 6) to be cost neutral. [Group 11, 2012]

Key Challenges

There are a few key challenges the groups reported the garden management team might face.

- According to Jay Baker-French (personal communication, 2012), the manager of the The Orchard Garden, there are different management requirements for gardens in summer, spring/fall and winter. Summer is when the garden requires the most labour. In winter, there is little labour to be done. For these reasons, history has come to dictate that students are on campus in the winter but not in the summer. For campus farming, this creates a volunteer shortage in the summer and surplus in the winter, making student engagement difficult. The Rooftop Garden management team will face this challenge. [Group 10, 2012]
- J. Baker-French (personal communication, 2012) also noted that turnover in management is very high in the campus setting as students come and go. Creating institutional memory is key to a successful management plan as it enables each generation of managers to build on what has been done by the previous management teams rather than struggle with the same challenges each year. [Group 10, 2012]

Management Strategies

Group 10 conducted questionnaires and interviews with key university organizations to better understand their student management strategies and requirements. The following summarizes their findings. [Group 10, 2012]

- The University of Toronto Sky Garden is managed by a team of three volunteers and two hired work-study students. The work-study students help with the labor in the garden and represent the largest cost to the garden. Volunteers share the produce yielded by the garden as incentive to participate. [Group 10, 2012]
- UBC's Sprouts Café has an elected managerial board. Half the board is elected each term to allow for in-person knowledge transfer between generations of board members. Additionally, each board member writes a transition report when leaving his/her position.
- Additionally, for each of Sprout's services/initiatives there is a handbook with detailed information about the initiative. In this way, new comers can easily learn about the programs offered [Group 10, 2012]. Agora Café and the LFS Orchard Garden have similar resources for their new executives and volunteers.

- According to J. Baker-French (personal communication, 2012), the garden would benefit from having a clear mission statement or mandate that serves to guide the management team in decision making as the years go by. [Group 10, 2012]

Small-Business Model

Group 10 researched and presented options for the management of the garden to be run as a cost-neutral, non-profit small business in which the garden produce is sold to campus stakeholders. A summary of their report follows.

Management Model Options

Group 10 explored a series of management options through intensive brainstorming activities including round table discussion, “Strength, Weakness Opportunity, Threat” (SWOT) analysis and consultation with the AMS New-SUB Sustainability Coordinator and Sprouts and with advice from campus stakeholders and similar organizations on other campuses, summarized below. Group 10 only considered student management models. [Group 10, 2012]

- AMS Student club. This club would be solely responsible for overseeing the garden activities.
 - Pros: low cost, potentially involves many students
 - Cons: Students often unavailable in summer, limited expertise
- Management by a single employee or directed studies student. In this model, one or two students would be responsible for overseeing the garden. Incentive would be either course credit or pay depending on how available human and financial resources.
 - Pros: student hired for expertise, more available in summer
 - Cons: higher cost, high turnover, potentially less involvement of other students
- Joint management. In this scheme, the garden would be managed in conjunction with other gardens on campus, specifically the LFS Orchard Garden was considered. This option was not pursued as it was felt that the management resources of other gardens are already maximized and that the new Rooftop site will present site-specific challenges that would warrant an independent management team.

Based on their analysis, Group 10 recommends an AMS club be established to manage the garden. However, they recommend that a directed studies student oversee the first year or two of operation to improve the chance of success of the establishment of the garden, the AMS club and garden management. [Group 10, 2012]

The recommended model would have the following components:

- For at least the first one to two years, one or two directed study student(s) would act as the garden expert(s) and would be responsible for overseeing the garden from April-September. They would be responsible for planning the garden and advising the AMS club members. They would report to a designated Professor who would act as their directed studies supervisor. An advising professor would select the student(s) through an application process. Group 10 recommends

that the professor be from the Faculty of Land and Food Systems and/or the Sauder School of Business.

- The AMS Rooftop Garden club would provide support to the garden coordinators through by carrying out fundraisers, applying for grants, and potentially helping with volunteer coordination. There is the potential that the AMS club could be active over the summer if enough students were available in the summer months. Group 10 recommends the club positions include: President, Vice-President, Secretary/Treasurer, Inventory, Internal Communications, External Communications, Production Manager, and Garden Workers. Group 10 has provided a draft Rooftop Garden club executive position descriptions, which can be found in their paper posted on the SEEDS website. [Group 10, 2012]

Other important recommendations

- According to J. Baker-French (personal communication, 2012), it is important to know the expected harvest yields, who will be purchasing the garden produce, and the pricing scheme for the products being sold. If there is uncertainty in these factors, it can be quite stressful for a management team who is responsible for balancing a budget and planning management activities. [Group 10, 2012]
- The first year, the team should plant a variety of crops to better understand demand and to develop a niche on campus. [Group 10, 2012]

Budget

The limiting factors for the garden management system are human and financial resources. Potential incentives for taking on the above described positions include academic credit for the directed studies students, and taking home produce or discounts/vouchers for purchasing the foods where they are sold for garden volunteers. If these incentives do not inspire a committed team of individuals, Group 10 cautions the AMS to be prepared to pay for a work-study position. [Group 10, 2012]

Group 10 provided the following budget estimates:

- Based on the previous estimate done by McMahan (2010) for the 500 sq. ft. garden, the annual net income for the 150 sq. mtr. garden is estimated to be \$2178.42. [Group 10, 2012]
- If a year round work-study student were hired (expenses estimated below), this would imply an annual deficit of \$1643-2310.
- No expense budget was prepared by the group.

Community Garden Style Management

Group 11 researched and prepared recommendations for the management of a community garden style garden in which community members apply for a garden plot for which they are responsible for one year.

The group reports that having a community garden with plots available to the student community, the Rooftop Garden would offer a select number of students access to very inexpensive vegetables, and thus could increase the food security and health of these students. [Group 11, 2012]

Demand for community garden plots

Group 11 researched how much demand there would be for plots in a community style garden. They found that the University Neighborhood Association community garden has a waitlist. Similarly, three of the four community gardens reviewed at other universities had waitlists. The universities that open the garden to non-faculty, staff or students, had the longest wait lists. The group looked at seven other community gardens in the nearby Vancouver area and all had waitlists with between 28-179 people. This demonstrates a demand for community gardens both within the university context and within the geographical region. [Group 11, 2012]

Of note, some of the university community gardens reported providing incentives for student participation, including offering communal garden plots, waiving plot fees, encouraging clubs to maintain plots and having plots for drop-in gardeners. [Group 11, 2012]

Proposed Management Models

Group 11 found that the most common management structures for the gardens reviewed were student clubs or one to two student garden coordinators. They also reported that the three essential components of managing a community-garden are a garden coordinator, garden guidelines for conduct and a budget. [Group 11, 2012]

The following summarized ways that the Garden coordinator(s) could be engaged:

- Full-time paid employee- This option was not pursued, as the costs are high and there is the potential for garden management to be taken away from the student body.
- Work-study employee- This is a lower cost option than the above, which provides incentive for a student manager to be present throughout the summer. However, work-study positions usually mean a high turnover, which has been a problem for the LFS Orchard Garden (J. Baker-French, personal communication, 2012).
- Directed studies students- This option has no costs, but could have very high turnover (potentially as frequently as once per semester).
- AMS student club/management board- This option has no cost and assures the garden will be student run. However, most students who might be involved in a student club are not present on campus during the summer. This has also been a problem for the LFS Orchard Garden (J. Baker-French, personal communication, 2012). [Group 11, 2012]

Group 11 recommended an AMS club be established to manage the garden. However, they also recommended that a directed studies student be put in place for the first year of operation to oversee the successful establishment of the garden, the AMS club and garden management. The following are Group 11's suggestions for the management team: President, Vice President, Treasurer, Secretary, PR/Outreach, General Club Members. A full description of the positions and the recommended responsibilities can be found in the student paper published on the SEEDS website.

The Garden Contract

Group 11 developed a garden contract that outlines the rules for participation in the community garden. The Acadia Community Gardens contract was used as a template because the gardens are located on the UBC campus and have been successful. The

full recommended contract can be found in the student paper published on the SEEDS website. [Group 11, 2012]

Some of the guidelines are summarized below.

- The application deadline for plots should correspond with the new election or start of the management team. Group 11 suggested a January timeframe for plot applications.
- Starting March 1, plot holder commits to tending their plot for one year.
- Group 11 felt plot holders should not be guaranteed a plot from year to year.
- Plots need to be maintained throughout the year or the plot holder risks losing the plot.
- Growing of illegal substances is not allowed.
- Running water cannot be left unattended in the garden. Plot holders should only water their own plots. [Group 11, 2012]

Other Recommendations:

Group 11 also offered the following advice for the management of a community style garden.

- Plot holders should put a deposit down to gain access (key or code) to the tool shed.
- The management team should maintain a waitlist for garden plots. If plot holders are not maintaining their plot after a warning, the plot should be handed over to someone on the waitlist.
- Garden attendance could be monitored using a log book.
- Communal garden spaces should be cared for by members holding a plot.
- Group 11 suggests only environmentally friendly fertilizers and pest control be used in the garden [Group 11, 2012]. The UBCFSP Coordinator suggests the garden should be designated as an organic garden in which chemical based fertilizers, herbicides or pesticides would not be allowed. [Group 11, 2012]

The Garden Budget

Group 11 proposed a budget, which is summarized below.

- The first year, costs will be about \$2,300. All other years the cost is estimated to be \$975. The reported cost estimates include purchasing/replacing tools and garden supplies, maintenance of garden infrastructure including beds and compost bins, outreach initiatives and community building initiatives. Berman (1997) suggests budgeting for mid-price-range tools because higher quality tool will last longer. The students also factored in the expected lifetime of the tools, based on the warranty and the depreciation of the tool to determine how regularly the tool would need to be replaced [Group 11, 2012]. The group did not provide the specifics of the budget.
- According to Group 11, the typical price for renting a garden plot in Vancouver is \$15-20 per year. [Group 11, 2012]
- Group 11 estimated that 60 plots at \$15-20 per plot would give the garden \$900-1200 per year. Based on these estimations, the plots would be very small at 3.5 ft. X 3.5 ft. with 1.5 ft. paths.
- The following are the UBCFSP Coordinator's calculations based on 150 meters squared (about 1500 feet squared). Most garden plots are about 5 ft. x 10 ft.

Assuming the garden space is roughly rectangular at 10 x 15 mtrs. (or 30 x 50 ft.), it is possible to have about 27 plots at 4 x 8.5 ft. with 1.5 ft. paths or 45 plots at 4 x 4.5 ft. with 1.5 ft. paths. The large plots could charge a membership fee of \$20, the small plots could charge \$15 per plot. This would result in \$540-675 per year. This is assuming plots on the surface of the roof rather than in pots. This gives a deficit of \$300-435 per year. This assumes that a work-study student does not need to be hired. [Group 11, 2012]

Supporting Information for Garden Management at UBC

Both student groups recommended having a directed studies or work-study student involved for the first one to two years of the project to help lead the development of the garden and set up the functioning of the AMS Club, which will be responsible for managing the garden on an ongoing basis. Additional information about these options follows.

AMS Clubs

AMS clubs must have a club constitution, a budget plan and one-year plan as dictated by the AMS Student Administrative Commission (SAC). You can find more information about starting an AMS club at <http://www.ams.ubc.ca/governance/student-admin-commission/sac-and-clubs>.

The groups also recommended the following for the proposed AMS club:

- Group 11 felt that the club executives/board members should be selected annually at a general meeting as is recommended by Berman (1997), Emerson (n.d.) and VCAN (2008). This process is also very typical for student run clubs [Group 11, 2012]. Group 10 felt that half the club should be elected in the fall and half in the spring to increase face-to-face information exchange between generations of managers [Group 10, 2012].
- Position transition reports should be written at the end of each term to help transfer information from one generation of managers to another. [Group 10, 2012]
- Building institutional memory and record keeping should be a priority for the student club and should be implemented at the very beginning phases of the garden. [Group 10, 2012]
- Human and financial resources are likely to change from year-to-year. Group 10 recommends that as financial resources build, that the garden management team consider adding additional services/initiatives. [Group 10, 2012]
- The UBCFSP Coordinator suggested that the club executive committee members commit to a set number of volunteer hours in the summer to assure summer management.

Directed Studies students

Directed studies students must complete a minimum of 80 contact/volunteer hours that are overseen by a Professor.

Work-Study students

Both groups discussed the potential employment of work-study students in their management plans. You can find information about UBC's work-study program at the

following address <http://www.students.ubc.ca/careers/students/work-and-volunteer-opportunities/work-study-work-learn>. To summarize:

- The work-study wage ranges from \$14.79-\$15.80. UBC subsidizes \$9 of this and requires the hiring UBC affiliate to pay the remaining \$5.79-6.80 per hour (UBC, n.d.).
- Summer work-study student must be enrolled in at least 6 credits, can work a maximum of 20 hours/week for a total of 300 hours, and must complete the 300 hours of work between May 1st and August 31st.
- Winter work-study students must be enrolled in at least 9 credits, can work a maximum of 10 hours/week for a total of 300 hours, and must complete the 300 hours between September 1st and April 30th.
- Each term would cost the garden between \$1737-2040. A yearlong work-study position would cost the garden double this amount.

Funding options

If after the initial one to two years, the Rooftop Garden AMS Club is unable to recruit sufficient summer volunteers, the AMS may need to hire a work-study student to care for the garden in the summer months. Funding options for this possible scenario are discussed below.

- Full-time garden management positions at Trent and McGill universities are paid for through student fees and grants (McMahen, 2010). The LFS Orchard Garden and Agora Café are student run initiatives that have coordinators that are paid through work-study positions. It is possible that the AMS could cover the additional expenses through their budget. [Group 11, 2012]
- The AMS Sustainability Fund can be applied for to help support infrastructure build out, purchasing of materials or other one-time initiatives.
- Garden workshops can be held and a small fee can be charged. The proceeds can go to the garden budget.
- The AMS matches funds for fundraising events for its student clubs. The AMS Rooftop Garden Club could hold fundraisers in the winter to cover the expenses of hiring a summer work-study student.

Rooftop Garden Advisory Committee

Both student groups recommended creating a Rooftop Garden Advisory Committee.

- Agora Café and the LFS Orchard Garden function with an advisory committee that helps the student management teams navigate challenges and align with the faculty's mandates and initiatives.
- Group 11 recommends that the committee be formed by members of the current garden committee design team with the addition of other important community stakeholders.

Recommendations

To the AMS New-SUB Committee

- Before the garden build-out in 2014, the AMS should determine if the garden will be run as a small-business or community-garden. Additionally, the AMS should decide on a vision statement or mandate for the garden. Once this has been

determined, the final management model should be further fleshed out. [Group 10 & 11, 2012]

- Once the management team is in place, share the Olson and Slater (1997) model with the students to help guide future decision making for the garden. [Group 10, 2012]
- Identify potential instructors for directed studies positions in Faculty of Land and Food Systems and/or Sauder School of Business who will be responsible for annually overseeing the directed studies projects for one to two students to manage the garden each year. [Group 10 & 11, 2012]
- Review the provided position descriptions for the AMS student club members and modify as necessary before recruiting students to join. [Group 10, 2012]

To the UBCFSP Coordinator

- Once the AMS defines a mission statement and decides on a management structure for the garden, create a scenario for the 2013 class aimed at further defining the management team. Students can conduct the following tasks:
 - Use the LFS Orchard Garden as a planning resource for record keeping and volunteer management.
 - Further define the AMS student club structure for the garden. [Group 10 & 11, 2012]
- Consider creating scenarios addressing the community-building and collaborative potential of the garden. Topics could include constructing a garden advisory committee, fulfilling the education potential of the garden, creating social media (blog or other site) to promote the garden, and to record garden metrics that can be reported to Campus Sustainability for inclusion in the annual “UBC Sustainability Reports” found at <http://www.sustain.ubc.ca/about-us/annual-sustainability-reports>.

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Scenario 7: UBC Farm Pilot Food Processing Center

Project Partner(s): Center for Sustainable Food Systems at UBC Farm

Group(s): Group 12

Full Paper Link:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/UBCFoodSystem_UBCFarmPilotFoodProcessing%20Center_Group%2012%20_FINAL.pdf

Background

Throughout the years of the UBC Food System Project, many stakeholder groups and LFS 450 students have identified the lack of food processing facilities in BC to be a barrier to year round use of local foods and thus increased food sovereignty and local food security. Members of the UBC Climate Action Plan (CAP) Food Action Team as well as several LFS community members have expressed interest in better understanding the potential benefits and challenges to on-campus food production. The CAP Food Action Team agreed to “undertake a feasibility assessment for an on-campus food processing facility” (CAP food action #13). In 2011, LFS 450 students began exploring what a food processing center at the UBC Farm might include. The Center for Sustainable Food Systems at the UBC Farm (UBC Farm) is now in the process of designing a new Farm Center. The design team has decided to include a food processing center as a component of the future Farm Center. The center will include research, teaching, and community programs. This year, the Center for Sustainable Food systems is looking for more input into what faculty on campus would like to see in the center.

Objective

Students were asked to investigate what UBC professors envision for the food processing and how they hope to include the center in their courses and/or research.

Central Findings

Group 12 discussed the context for the proposed food processing center. A summary follows:

- Group 12 points out that the ability to process food is fundamental to food sovereignty in the Vancouver area as processing is necessary to preserve food for the winter. However, the Metro Vancouver and British Columbia in general have very few food processing facilities and therefore limited capacity to process foods of a variety of types. [Group 12, 2012]
- Additionally, food processing centers can contribute to the local economy by supplying jobs and keeping food dollars in the community. [Group 12, 2012]
- Local food processing could also encourage a more diverse group of people to engage in food citizenship and support a sustainable local food system. [Group 12, 2012]

UBC Farm Vision for the Processing Center

Group 12 focused their project to meet the needs of the Center for Sustainable Food Systems at the UBC Farm (UBC Farm) as identified by Andrew Riseman, Academic Director of the UBC Farm, and Andrew Rushmere, Academic Coordinator of the UBC

Farm. Riseman and Rushmere (personal communication, 2012) indicated that it is very important to be able to demonstrate academic interest in the facility in order to gain support for the facility from the broader UBC community. [Group 12, 2012]

According to Group 12, the goals of the UBC Farm mid-scale food processing center are to a) "Facilitate teaching and research on food processing and its connections to the broader food system"; b) "Enhance UBC Farm's income and program diversity through value-adding"; and c) "Enhance awareness of the various components of a sustainable food system at UBC within the context of the Lower Fraser Valley regional food system." [Group 12, 2012]

Group 12 reports that the UBC Farm would like to be able to open the processing center to community members. [Group 12, 2012]

Project Results

The students carried out research in the areas of "academic connections," "regulations review," "equipment needs," and "product market analysis."

Academic Connections

Group 12 reviewed the UBC course list and made a list of faculty members that may have an academic interest in the food processing facility including instructors for courses relating to food processing, food engineering, food marketing, food regulations, food science, food analysis, waste management, building construction, teaching, business administration, and marketing management. The group emailed an eight question survey to a total of 52 UBC faculty members and received a total of 11 responses, all of which were from faculty in Land and Food Systems. [Group 12, 2012]

The following is a summary of the survey findings:

- When asked how they thought they would use the food processing facility, eight respondents said they were interested in using the facility in the courses they offer, seven said directed studies, seven said graduate research and six said undergraduate research. Five professors said the facility could have other uses as well such as beer production, product development, professional development, community outreach and the Food Science student club.
- When asked how frequently they envisioned using the facility, four professors said occasionally, three said monthly, and one said weekly. Two professors said that the amount of time spent at the facility would differ project by project.
- When asked what types of products the facility should be capable of making, jams, condiments, soups, cheese/yogurt, granola/trail mix had five votes each, juice had four votes and baked goods had two votes. Other ideas professors had include beer, fruit/vegetable leathers, fresh salad mixes, dried fruit, dried herbs, fish/seafood. One professor mentioned there should be no limit to the products that can be produced. Two professors mentioned that food safety should be considered when producing these products.
- When asked what food processes they would be interested in exploring, seven professors said drying, seven fermenting, five canning, four smoking, four vacuum packing, three freeze drying, two curing, and none said baking. Other ideas included nut roasting, blanching, and pasteurization.

- Five professors were interested in waste management, four in alternative energy use, four in system analysis, four in small business planning, four in marketing, three in finance, and one as an event location. Group 12 concluded that this demonstrated interest in alternative academic uses of the facility, which is also important in the facility's relevance to the wider university.
- One professor commented that his Advanced Food Biotechnology course has not been able to incorporate necessary food production components due to a lack of processing facilities. Group 12 points out that this demonstrates a clear need for the processing center.
- The processing center would offer a location for demonstrating how equipment works and offering laboratory opportunities for the courses FNH 300, 309, 325 and 326 as well as LFS 250.
- One professor warned that a facilities manager will be necessary to ensure the facility is well maintained and properly cleaned. [Group 12, 2012]

Regulations Review

Group 12 aimed to outline regulations that may apply to the food processing center to help identify challenges that may arise in implementing food processing.

The group interviewed a Food Inspection Specialist of the CFIA, Joan Soriano (personal communication, 2012). According to her, CFIA regulates inter-provincial and international trade. The UBC Farm facility will be small scale and will focus on sales to the local community; therefore, Vancouver Coastal Health (VCH) regulations are more applicable. [Group 12, 2012]

A summary of the group's findings follows.

- VCH is responsible for inspecting formulation of product, product ingredients, process of manufacture, cooking, holding, and storage time, and product labeling (VCH, 2012).
- VCH recommends using the Hazard Analysis Critical Control Point (HACCP) and Good Manufacturing Practices (GMP) for maintaining high food safety standards. More information on these systems can be found at <http://www.inspection.gc.ca/food/fsep-haccp/eng/1299855874288/1299859914238> and <http://www.hc-sc.gc.ca/dhp-mps/compli-conform/gmp-bpf/index-eng.php>.
- CFIA food regulations can be used as a guide for ensuring high standards of food safety. The regulations can be searched for at <http://laws-lois.justice.gc.ca/Search>.
- The Small-Scale Food Processors Association offers food safety classes and consulting for small-scale food processors. More information can be found at <http://foodsafety.ssfp.net/>. [Group 12, 2012]

Group 12 noted that once the food processing processes for the facility are decided on, more detailed policy and regulation research should be done.

Equipment Needs

A list of potentially useful equipment was prepared based on the food processing processes identified as of interest to the survey respondents. Group 12 outlined potential equipment, but noted that the final list of equipment needed depends on

details of the final design for the facility and the selected processes that the facility will be capable of carrying out. Information was gathered from the University of Nebraska-Lincoln Food Processing Center's online equipment inventory found at <http://fpc.unl.edu/web/food-processing-center/processing> and British Columbia Institute of Technology's online equipment inventory list found at <http://www.bcit.ca/health/industry/foodcentre/facilities.shtml>. [Group 12, 2012]

The full list of equipment can be found in the student paper found in the SEEDS library.

Product Market Analysis

Based on the products of interest to the survey respondents, Group 12 conducted a cost analysis for the UBC Farm ingredients needed to produce the products. The group collected the prices of comparable products at Whole Foods Market. The Group then calculated how much UBC Farm produce would be required to make each of the products and what the cost of the produce would be. The Group did not estimate the full cost of the production of the product or other product ingredients. As such the following product costs are extreme underestimates of the final cost of the products.

- Raspberry Jam: Retail price range \$18.68-\$35.96/L; cost of raspberries \$43.20/L @ \$4.50/ ½ pint raspberries; loss of \$7.24-\$24.52/L
- Apple Sauce: Retail price range \$5.89/L; cost of apples \$4.80/L @ \$2.00/lb apples or \$9.60/L @ \$4.00/lb apples; between a surplus of \$1.09 and a loss of \$3.71/L
- Brined Pickles: Retail price range \$6.65-\$8.52/L; cost of cucumbers \$3.00/L @ \$2.00/lb;; surplus of \$3.65 to \$5.52/L
- Brined Sauerkraut: Retail price range \$13.32/L; cost of cabbage \$4.38/L; surplus of \$8.94/L
- Pickled Green Beans: Retail price range \$17.32/L; cost of green beans \$7.50/L; surplus of \$9.82/L
- Veggie Soup: Retail price of \$9.29-\$9.99/L; cost of veggies \$4.87/L; surplus of \$4.42 to \$5.12/L [Group 12, 2012]

Based on these calculations, Group 12 feels that raspberry jam and apple sauce are not economically feasible products and that the UBC Farm can likely make more profit from the direct sales of the produce. Apple seconds may be useful for making apple sauce depending on the quantity of seconds produced at the UBC Farm each year. [Group 12, 2012]

Group 12 concludes that there is potential to make a profit by producing pickles, sauerkraut, pickled green beans and veggie soup. However, further investigation into the other costs associated with production of the products would be necessary. [Group 12, 2012]

Due to the high price that UBC receives for its produce, processing does not always mean a higher value for the product. However, these same processed products may be economically feasible using produce grown at other farms in the Lower Mainland purchased wholesale. [Group 12, 2012]

The Canadian non-profit third party organization, Local Food Plus, offers the 'Certified Local Sustainable' certification to food producers and processors that support the local

economy and employ environmentally responsible production techniques. [Group 12, 2012]

Recommendations

To the UBC Farm Processing Center Team

- Carefully select the products chosen for processing based on their ability to turn a profit for the UBC Farm.
- Consider processing other products using produce from other farms in the Lower Mainland if deemed economically feasible. Farms can be identified through the local growers association.
- Innovative marketing for these products can focus on the benefits of the locally grown and processed foods.
- In future years, have LFS 450 students investigate the different possible certifications/labels that the processed foods could have and the benefits and logistics of obtaining each.
- When appropriate, LFS 450 students could also be requested to research and develop a product line. Potentially, this could be carried out in collaboration with Food and Resource Economics students and/or Sauder School of Business students to determine the economic feasibility of the proposed products.
- Determine the timeline for the processing center build out. Disclose this information the UBCFSP Coordinator, such that s/he may plan future scenarios for the project.
- Consider creating a survey for UBC faculty that is specifically designed for other faculties. Tailoring a survey may inspire other faculty members in envisioning how they could use the food processing facility.
- Food safety should be considered in the layout and every step of the design of the food processing center space.

To the UBC Farm Academic Director and Coordinator

- Involve other faculties in the design of the processing center. For example, engineering students can help with clean energy design.
- Group12 recommends that a professional oversee the overall design process.

To the UBCFSP Coordinator

- In future iterations of the project, scenarios should focus on increasing interest and involvement by more faculties, professors and classes. This could be done by preparing letters inviting research ideas that are tailored to each faculty.
- Work with the Climate Action Plan to meet the goal of determining the potential GHG emission benefits of the future facility. It is possible that studies on the facility's GHG emissions can be worked into the design of and plans for the facility.

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Scenario 8: UBC Campus Food Guide - A UBC Farm Communication Tool

Project Partner(s): Center for Sustainable Food Systems at the UBC Farm, University Sustainability Initiative (USI) (Andrew Riseman)

Group(s): Group 13 and Group 14

Full Paper Links:

- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/UBCFoodSystem_UBCCampusFoodGuide_AUBCFarmCommunicationTool_group13_FINAL.pdf
- http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/UBCFoodSystem_UBCCampusFoodGuide_AUBCFarmCommunicationTool_group14_FINAL.pdf

Background

All across the UBC Campus there are opportunities to support a more sustainable campus food system, from purchasing local, organic or fair-trade products to volunteering at the UBC Farm or the LFS Orchard Garden to learning how to prepare a homemade meal at Sprouts or Agora Café. On-campus food providers such as UBC Food Services and the AMS Food and Beverage Department have been committed to making improvements to their food offerings for over 10 years such that UBC now offers only Fair Trade coffee, all whole fruit is either local or fair-trade and all whole eggs served on campus are free-run. However, these improvements often go unrecognized by the wider UBC community meaning there is more potential support for the programs and initiatives that are offered. This past summer's UBC Food System Project Partner Workshop brought a consensus among the UBC Food System Project partners that a clear communication strategy is key to be able to continue to make improvements to the campus food system and to encourage increased participation by community members. As a result, project partners identified a campus food guide as a useful tool to help increase awareness of what is happening at UBC. The hope is that such a guide

can increase the wider community's knowledge, attitudes and practices around food system sustainability and can increase the visibility of the campus food system sustainable initiatives. [UBCFSP Scenarios 2012]

Objective

Students were asked to develop a UBC Campus Food Guide to help increase awareness and communication about sustainability initiatives in the UBC Food System and ways for students to get involved.

Central Findings

The student groups conducted a literature review to help understand the context for the campus food guide. The following are a few highlights from their findings.

- In his book *Food Rules*, Michael Pollan (2009) points out that it is important to communicate to consumers the true cost of the production of foods; many foods are subsidized and have environmental impacts that are not accounted for in their retail price. [Group 14, 2012]
- Agriculture and Agri-Food Canada (2006) reports that 37% of Canadians get nutrition information from the internet while 27% from media sources. This shows that the guide might be effective in spreading food knowledge. [Group 14, 2012]
- Group 13 warns that locally sourced foods are not always better. Pulling from Dupuis and Goodman (2005), Group 13 points out that being local is not enough; the local system must also be an alternative, non-industrial system to have the environmental and economic outcomes desired. [Group 13, 2012]

What's happening at UBC

Nijaki and Worrel (2012) also point out the power of institutions to drive change in food supply. Bartlett (2011) says that processes applied and learned at universities can be extended to broader contexts with the potential to lead to huge food system sustainability advances. Group 13 points out that the size of UBC Food Services gives the university some power to affect supply chains. [Group 13, 2012]

The following is a list of a few of UBC's food system sustainability initiatives identified by the groups:

- In 1997, UBC established a sustainable development policy as a first step in becoming a sustainability leader among North American universities. [Group 13, 2012]
- In 1998, the UBC Campus Sustainability Office was created. The office is now called Campus Sustainability. [Group 13, 2012]
- In 2011, UBC was named Canada's first Fair Trade campus. Fair Trade certification is used to help guarantee a fair price to growers and producers. Sick (2008) reports coffee to be the most heavily traded commodity in the world. Therefore, it is important that all campus non-franchise food establishments are serving organic Fair Trade coffee. However, Sick (2008) and Levi & Linton (2003) have expressed doubt that Fair Trade certification provides significantly better economic or social benefits to the growers and producers. [Group 13, 2012]
- UBC is a "Cage-free campus" as it uses 100% cage free whole shell-on eggs according to Chicken Out (n.d.). [Group 13, 2012]

- Sprouts café, Agora Café and to some extent UBC Food Services source produce from the UBC Farm and the LFS Orchard Garden. Follett (2009) pointed out that direct sales between producer and consumer increase information sharing between producer and consumer. This can be seen in the UBC food system, as much more is known about the foods grown on campus compared to food purchased from other suppliers. [Group 13, 2012]

What other campuses are doing

- UC Davis: Barlett (2009) describes how UC Davis food suppliers are encouraging change and developing supply chain channels as they commit to spend 20% of their budget on sustainable foods by 2020. This represents \$20-25 million annually (Barlett, 2009). [Group 13, 2012]
- UBC Santa Cruz: The UC Santa Cruz Food Guide brings attention to the campus food system by listing campus activities, showing the local and organic food options available on campus, providing information on local sustainable food practices and listing events and opportunities for involvement on campus and off campus. The UC Santa Cruz guide has a communication objective to “create connections and foster a strong network of people who want to build a more sustainable food system” (UC Santa Cruz- Food Systems Working Group, 2010). [Group 14, 2012]
- Yale University: The Yale website provides samples of seasonal menus, definition of sustainable purchasing, ways to get involved, and events to help students “experience food, agriculture, and sustainability as integral parts of their education and everyday life” (YSFP, 2012). [Group 14, 2012]
- Harvard University: Harvard’s Sustainability Pamphlet offers tips on being more sustainable (Harvard School of Public Health HSPH, 2012). Only a small part of this is focused on food systems. [Group 14, 2012]

AMS Sustainability Grant

The two student groups were successful in applying for and receiving a grant from the AMS Sustainability Fund for the amount of \$1999. The grant is to cover the printing costs of the first edition of the Food Guide. The UBCFSP Coordinator will oversee the grant until the guide is ready to be printed. [Group 14, 2012]

Effective Communication Tools

Both groups conducted research on developing effective communication tools. The results of their research follow.

Written Contents

- WIPO (2012) says it is a good idea to gauge what readers already know [Group 14, 2012]. The UBCFSP Coordinator suggests using the 2012 Scenario 5 survey results to inform what UBC campus community members know can be derived from the student survey.
- Kaplan and Kaplan (1982) point out that written material should be easily understood and engaging to the reader. [Group 13, 2012]
- Wigington (2008) suggests putting the most important messages towards the beginning of the tool and only including the most crucial concepts. For brochures, the Center for Disease Control (2009) recommends a maximum of three messages. [Group 13, 2012]

- Young and Witter (1994) state that brochures that make connections between sections and encourage the reader to read on for further information are more successful than those that do not. [Group 13, 2012]
- Writing should be short and simple and the language should be appropriate for the knowledge level of the readers (WIPO, 2012). Young and Witter (1994) say that brochures should use concrete and personalized words. [Group 13, 2012]
- Weiner (2007) suggests that the heading should be no longer than eight words in length.
- Young and Witter (1994) found that connections within headings and text increased the effectiveness of the brochure. [Group 13, 2012]
- Wigington, 2008 says that bullet-pointed lists should be clear and contain no more than seven points. [Group 13, 2012]
- Wigington (2008) recommends body texts be in serif type fonts at 12-14 pt. Special fonts such as cursive, italics and capital letters should be avoided. [Group 13, 2012]
- The UBCFSP Coordinator suggests following UBC's writing and style guidelines when developing the written material for the communication tool. More information available at: <http://www.publicaffairs.ubc.ca/styleguide/>

Visual Graphics

- Young & Witter (1994) found that the design of the brochure/booklet is more important to the effectiveness of the booklet than is the content. [Group 13, 2012]
- Gilbert and Houghton (1991) said that clarity and simplicity are key in attracting a browsing reader. Both Gilbert and Houghton (1991) and Herrod and Whitlark (2000) said readers should be able to tell what the booklet is about at a glance. Logos and brand names are helpful to the reader for recognition value (Gilbert and Houghton, 1991). [Group 13, 2012]
- Gilbert and Houghton (1991) discussed the importance of the cover page graphic in peaking the interest of the reader. A younger audience is attracted to bright and vibrant colors. [Group 13, 2012]
- Young & Witter (1994), Gilbert & Houghton (1991) recommended using color photographs as they are considered more effective in promoting the brochure. [Group 13, 2012]
- Gilbert & Houghton (1991) found that higher quality paper are more likely to be picked up. [Group 13, 2012]

Components of the Campus Food Guide

The following section details the components of the Food Guide proposed by Group 13 and Group 14.

Sustainable Food Outlets on Campus

Group 13 composed a list of sustainable food outlets on campus. Outlets were considered sustainable if they served an all vegetarian menu, offered substantial vegan menu options, had sustainable meat options (free-range, grass-fed, medication free), had organic food items (determined through a survey), had local products, had UBC Farm and/or LFS Orchard Garden produce, offered Fair Trade/organic/shade grown

certified coffee, had Oceanwise seafood and/or humanely raised animal products. Outlets that only offered limited vegetarian or organic items were not included in the list. [Group 13, 2012]

Based on their campus wide investigation, 28 food outlets were identified, 18 from UBC Food Services, three from AMS Food and Beverage Department and six independents. Four food production locations were also identified including The Orchard Garden, UBC Farm, Acadia Community Garden and the University Neighbourhood Association Community Garden. A full list of the included outlets can be found in Group 13's report on the SEEDS web page. [Group 13, 2012]

Group 13 notices a lack of marketing and signage for sustainable food products at all the food outlets they visited. The group had trouble identifying if sustainable products were offered and feel that other campus consumers would face the same difficulties. [Group 13, 2012]

Volunteer opportunities

Group 14 researched ways that Food Guide readers can engage and become active members of the UBC campus food system. The group contacted organizations on campus for information. The group provided a description of ten organizations and offered each organization an opportunity to supply feedback on their write up. [Group 14, 2012]

Group 14 also provided drafted copies of the following sections of the food guide. The full write-ups can be found in Group 14's paper on the SEEDS web page.

- Definition of Food Citizenship- Group 14 feels that the food guide can increase the potential for food citizenship by increasing awareness and opportunity. According to Gliessman (2007), the term "food citizen" is used to describe an individual who considers social and environmental impacts of their food choices when choosing food and tend to make choices based on the "origin, means of production, and range of accessibility." [Group 14, 2012]
- Food sustainability tips- A list of ways people can become more engaged in being better food citizens and making the campus food system more sustainable. [Group 14, 2012]
- Education opportunities- A list 19 food system education opportunities on campus. [Group 14, 2012]
- Seasonal Food Guide- A list of vegetables and fruits that are locally grown in each month of the year. [Group 14, 2012]

Group 14 also recommended the following sections be prepared for the food guide. [Group 14, 2012]

- Centerfold map of sustainable food locations on campus- A large map detailing sustainable food outlets and composting containers or facilities on campus.
- Information on campus initiatives- A list of campus wide food system sustainability initiatives.
- QR code linking to Cropedia- Cropedia is a local food encyclopedia created by LFS 450 students.

Food Guide Design

The groups worked on proposing a design for the guide as well. Their design efforts are summarized below.

- Duncan McHugh, the Multimedia Coordinator for the FLFS Learning Center, was consulted on the design of the guide. McHugh (personal communication, 2012) recommended using bright colours, white space, the rule of thirds and text columns to make the design of the guide interesting. He also noted that use of graphics can help keep the reader engaged (McHugh, personal communication, 2012). [Group 13, 2012]
- The Apple program Pages was used to layout the draft Food Guide prepared for submission by the groups.
- Group 13 wants to include photos of farmers to "give food a face," which Gillespie & Smith (2008) suggest can help connect people to their food system. [Group 13, 2012]
- The groups decided the guide should be a half 5.5" x 8.5" size and that the pages should be printed on both sides. [Group 13, 2012]

Recommendations

To the UBCFSP Coordinator

- Obtain feedback from stakeholders prior to further development, design and planning. [Group 13 & 14, 2012]
- Future scenarios can continue the development of the food guide and oversee the printing of the guide. Students can conduct an acceptability trial and gain consumer feedback for the survey. [Group 14, 2012]
- Once the guide is completed, someone or a group should be appointed to update the guide on an annual basis. [Group 13 & 14, 2012]
- Group 13 feels that a web-version of the guide should be produced with priority over printed versions. [Group 13, 2012]
- Consider distributing the guide in a variety of formats including websites, events tables, direct mailings and through specific organizations such as those featured in the guide. [Group 14, 2012]
- The guide should be distributed to all new UBC students on Imagine Day. [Group 14, 2012]
- A communication objective for the UBC Food Guide or a Food Guide purpose statement should be created to help determine what the contents of the guide should be. This can help guide future editions of the guide as well. [UBCFSP Coordinator]
- Group 13 believes that a food guide for the Great Vancouver Area should be designed, however this is out of the scope of the UBCFSP. [Group 13, 2012]

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