

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

Exploring Ways to Lighten the Pit Burger Bar's Ecological Footprint

Stephanie Jacques

Carol Cham

Jason Cheng

Charise Lo

Simone Cheung

Yvonne Dang

University of British Columbia

LFS 450

April 2010

Disclaimer: "UBC SEEDS provides students with the opportunity to share the findings of their studies, as well as their opinions, conclusions and recommendations with the UBC community. The reader should bear in mind that this is a student project/report and is not an official document of UBC. Furthermore readers should bear in mind that these reports may not reflect the current status of activities at UBC. We urge you to contact the research persons mentioned in a report or the SEEDS Coordinator about the current status of the subject matter of a project/report."

**Exploring Ways to Lighten the Pit Burger Bar's
Ecological Footprint**

LFS 450

April 16, 2010

Group 20

Stephanie Jacques

Carol Cham

Jason Cheng

Charise Lo

Simone Cheung

Yvonne Dang

ABSTRACT

The UBC Food System Project connects students with stakeholders from UBC's Alma Mater Society (AMS) with the intent of providing opportunities to make the campus' food system more sustainable. The objective of our scenario was to work alongside one of the AMS food venues to propose a new menu item, or alternative ingredients for a current item, that meets the criteria of the AMS Lighter Footprint Strategy. This menu item should reduce the Ecological Footprint of the venue that we are assigned, which was the Pit Burger Bar. Our group reviewed previous LFS 450 reports, as well as peer-reviewed and popular literature regarding Ecological Footprinting and similar projects. We conducted an interview with the manager of the Pit Burger Bar to assess his vision for the project and assess the potential limitations regarding proposing a menu item. Also, a paper survey was developed to evaluate consumer preferences regarding current menu items and potential future options. The results of the consumer preference survey showed that beef burgers that were purchased the most but that there was a significant level of interest in having a greater selection of vegetarian and local menu items.

Although addressing the ecological footprint of the beef patties would have had the most significant impact on the sustainability of the Pit Burger Bar, our group decided that we would focus on proposing a menu item that was meat-free and that made use of ingredients from a local producers. After researching an appropriate recipe, we came up with that of apple fries. Finally, we included recommendations for future LFS 450 groups, stakeholders and collaborators.

INTRODUCTION

We begin our paper by introducing and defining the problem and by analyzing the vision statement. We continue with a section on our methodology and then we present our results and discuss their relevance. Our paper finishes off with our recommendations for stakeholders, collaborators and future LFS 450 students and then we end with the conclusion of our paper.

PROBLEM DEFINITION

The environmental pressures that are caused by a growing global population, as well as a rise in per capita consumption, have created an ecological deficit. A deficit occurs when the resources used exceed the biocapacity of the Earth (Kitzes, Peller, Goldfinger, & Wackernagel, 2007). In order to maintain this level of consumption, resources are taken from future supplies. This deficit is exacerbated by globalization, which has contributed to longer transportation of goods and services and distancing between producers and consumers (Princen, 2002). Distancing causes a disconnect between consumers and information regarding the fluctuations in resource availability and the environmental costs associated with their consumption patterns (Princen, 2002). Ultimately, this lack of knowledge reduces the ability of individuals to reduce their environmental impact.

The first step to reducing the ecological deficit is to ensure that people have adequate knowledge about the environmental impact of their consumption practices. The concept of the ecological footprint (EF) was designed to give a value to commodities and services that reflects their impact. According to the Environment Canada (2008), an EF is a measurement of the area of arable land and aquatic ecosystem that a human population

requires to produce the resources it consumes and to absorb its wastes. This value facilitates the analysis of the environmental impact of commodities and activities, relative to each other, to determine which should be targeted by efforts to reduce the ecological deficit. Wackernagel and Rees (1996) suggest that the food system is responsible for thirty percent of our EF. Therefore, the food system is a significant target for EF reduction efforts.

The objective of our scenario is to work with the AMS Food and Beverage Department (AMSFBD) to promote the Lighter Footprint Strategy by focusing on reducing the EF of the university's food system (UBCFSP Scenario, 2010). More specifically, we were asked to work alongside with one of the AMS's food venues to increase their selection of lighter footprint menu items. Ideally, the proposed menu item would be vegan or vegetarian or it would contain local, organic or seasonal ingredients.

Our group chose to work with the Pit Burger Bar because since it had not yet been involved in the UBC Food Systems Project. This gave us more freedom to choose the direction in which we wanted the project to go. Also, given our previous knowledge of EFing, we assumed that the Pit Burger Bar had a large EF, and could benefit from our efforts to reduce it.

VISION STATEMENT

After reviewing the Vision Statement, our group discussed the listed items that we felt were important and we collectively agreed on most of them. We felt that the points adequately covered all of the aspects of sustainability. Specifically, there were four points that we strongly agreed upon:

1. ***Food is locally grown, produced and processed:*** We feel that this point is detrimental to the health of the environment as locally grown, produced and processed foods play a dramatic role in reducing the food system's EF. In reducing the amount of processing that is done, the energy transfer from farm to table becomes more efficient. Also, locally grown foods reduces the amount of transportation used, a significant contributor of carbon emissions, and supports the local food system at the same time. One of our members stated that, "Food is grown in our soil and should be be consumed soon after it touches our hands."
2. ***Food is ethnically diverse, affordable, safe and nutritious:*** Canada is a multicultural country, therefore, there is great demand for a variety of different foods. Most of us felt that the desired food should be accessible and available for everyone regardless of their background. One group member stated that although ethnically diverse foods are desirable, the system which allows them to be available worldwide is fundamentally unsustainable.
3. ***Food brings people together and enhances community:*** We believe that a sense of community can be built from the many human interactions involved in harvesting foods at a farm, bringing them to a market to sell and then finally bringing them home for consumption.
4. ***Providers and educators promote awareness among consumers about cultivation, processing, ingredients and nutrition:*** Our group is unanimous in our belief that it is important for consumers to be able to understand food labels when purchasing groceries. We feel it's important to be educated about where food comes from, how it is produced, and what it contains. With better education, consumers can make informed

decisions about which foods to purchase according to the quality of the food and its effect on the environment, rather than its cost.

METHODOLOGY

Our group started by reviewing the literature provided to us in our scenario folder, such as former LFS 450 reports, UBC documents and procurement reports. Considering the Pit Burger Bar had not previously been involved with the LFS Food System Project, there was a limited amount of relevant information provided to us. In order to compensate for this, we did extensive research on other institutions and venues that have similar programs including other AMS food venues. We also searched for literature regarding the EFs of food items on the Pit Burger Bar menu, which allowed us to determine the ranking of the menu items based on their EF. We also researched about different varieties of foods that are available in Vancouver during each season to facilitate the development of a menu item that would could potentially contain locally produced ingredients.

Once we had adequate background knowledge of the literature and the project, we conducted a face-to-face interview with Donovan Larson, the manager of the Pit Burger Bar, and attended a Question and Answer session with Nancy Toogood, the Food and Beverage Manager of the AMS Food Service.

In collaboration with the another group assigned to the Pit Burger Bar, we composed a survey of which each group conducted approximately 100 surveys (refer to the Appendix A for a copy of our survey). The surveys were distributed near the Pit Burger Bar on several different days of the week in order to get a more representative sample. Based

on the survey results and our interview with Donovan, we began our search for an appropriate recipe for the Pit Burger Bar.

Lastly, upon deciding on working with apples, we experimented with "Apple Fries" recipes to determine which recipe will provide the best product. The final recipe can be found in Appendix B.

FINDINGS AND DISCUSSION

Review of Previous AGSC 450 Projects

As the first group in LFS 450 to collaborate with the Pit Burger Bar, we were able to review past projects that dealt with a similar focus. Successful projects like 2006's scenario with Bernouilli's Bagels and 2008's Blue Chip Cookies provided us with a clearer direction on the incorporation of local and plant-based food ingredients. They also addressed why local and plant-based foods are important aspects of the movement towards a more ecologically friendly campus food system. Taking in valuable information from both scenario cases, we decided that it was essential for us to focus on proposing a menu item with more local and vegan ingredients to reduce the Pit Burger Bar's EF.

Review of What Other Institutions and AMS Food Venues Have Done

We have reviewed a list of Canadian institutions and AMS venues to see what they have done to reduce their EFs. More specifically, we focused on finding potential menu item ideas that would be appropriate for the Pit Burger Bar.

Other Institutions:

- *University of Alberta:* The Augustana Cafeteria offers at least one «Local Lunch» per month where all the food used in the meal is local. The «Local Lunch» is offered at the same price as the regular lunches (University of Alberta, 2010).
- *University of Western Ontario:* The residence dining café purchases locally produced, processed and organic foods in attempt to reduce their EFs (Univerisity of Western Ontario, 2009).
- *McGill University:* McGill food services are provided by Compass Group Canada, which provides 90% of food products that are produced in Canada (Compass Food Canda, 2008).
- *University of Guelph:* University of Guelph’s Hospitality Services purchases food locally and a large percentage of their menu items are made from scratch, which reduces the amount of processing of their food (Hospitality Services, 2009).

AMS Food Venues:

- *Bernoulli’s Bagels:* Non-processed and canned food ingredients are all local. All the food items are organic except for processed and canned food ingredients (A. Douglas, personal communication, March 19, 2010).
- *Blue Chip Cookies:* The venue uses organic Fair Trade coffee beans and tries to use as much local ingredients as possible. It offers some vegan options and special “Lighter Footprint” labels were used to promote those vegan options (S. Lam, personal communication, March 18, 2010).
- *Honour Roll:* Most ingredients used are local and the venue offers some vegan options. Also, it offers a discount for customers who bring their own containers and serves free

green tea for customers who bring their own mug (J. Chang, personal communication, March 19, 2010).

- *Pi-R Squared*: Most ingredients used are local and some are obtained from the UBC farm. Some pizzas are made based on seasonal availability of ingredients (G. Sutiono, personal communication, March 22, 2010).
- *Pendulum*: The venue offers organic coffee beans and has many vegan and vegetarian options (B. Hutson, personal communication, March 22, 2010).

From the information listed above, it is obvious that many Canadian Universities and the AMS venues are striving to reduce EFs by offering more organic, local and/or vegan options. Therefore, for the Pit Burger Bar, we would like to develop a recipe which requires local and vegan ingredients.

Ranking the Menu Items According to their Ecological Footprint

In order to establish which ingredients had the largest EF, we analyzed the menu and came up with a list of prominent ingredients and did a literature search to find their EF. Similar ingredients were grouped together to form the following categories: beef, cheese, fish, poultry, processed vegetables, bread and fresh vegetables.

Collins and Fairchild (2007) and Gill (2005) calculated the EF per unit weight for each food category. The EF is given in global hectares (gha), which is defined by Santa-Barbara Family Foundation (2003) as a hectare of biologically productive space with an annual productivity equal to the world average. Also, the set of values given by Gill (2005) were originally in gha per tonne and so we changed tonnes to kg to match the values given by Collins and Fairchild (2007). Considering that the EF of foods is dependent on the

population and the area, we will analyze the ranking order, rather than the values given in each set.

| Food products used by Collins and Fairchild (2007) | Gill (2005) | gha/kg |
|---|-------------------------|---------------------------|
| the Pit Burger Bar | gha/kg | |
| Beef | 0.0157 | 0.02140 |
| Cheese | 0.0111 | 0.01521 |
| Poultry (cooked) | 0.0032 | 0.01133 |
| Fish | 0.0101 | 0.00681 |
| Processed vegetables | 0.0005 | 0.00140 |
| Bread | 0.0005 | 0.00107 |
| Fresh vegetables | 0.0004 (Green – 0.0003) | 0.00156 (Green – 0.00138) |

Table 1. The EF of the Pit Burger Bar ingredients

According to Table 1, beef and cheese have the largest and second largest EFs, respectively. The next largest EF belongs to either fish or poultry. Although fish was found to be higher in Collins and Fairchild’s (2007) analysis, it was not specified whether the value was for farmed or wild fish. Since the salmon used at the Pit Burger Bar is wild, the EF would be significantly lower than the farmed fish EF value (Rees, 2001). Therefore, we considered poultry to have the 3rd and fish to have the 4th largest EF. The processed and fresh vegetables and the bread had relatively similar EFs in both cases. However, there was a noticeable inconsistency regarding the fresh and processed vegetables. According to Gill (2005), fresh vegetables have a larger EF than processed vegetables because they have more packaging and are transported for longer distances.

Interview Results

From the interview with Donovan Larson, the manager of the Pit Burger Bar (refer to Appendix C), the results indicated that he was open to any new menu ideas as long as the recipe addresses consumer demands, is affordable for consumers and has minimal

preparation. He also gave us permission to to design a survey for the Pit Burger Bar regarding consumer preferences.

Survey Results

Our survey was constructed for the purpose of understanding consumer demands and preferences of the food items offered at the Pit Burger Bar. The survey results would, ideally, assist us in proposing a new lighter footprint menu item that reflects both the consumer demands and the Lighter Footprint Strategy criteria.

Our sample size was 141 consumers but the number of responsive survey participants was 115. This resulted in a response rate of 81.5%. The location of our survey was near the Pit Burger Bar because we decided to target the Pit Burger Bar’s current consumers. Although random sampling would reduce our survey’s bias, we decided to focus on consumers that would be more likely to purchase a menu item from the Pit Burger Bar. Due to our relatively large sample size and high response rate we concluded that our results were reflective of our survey focus and consumer opinions.

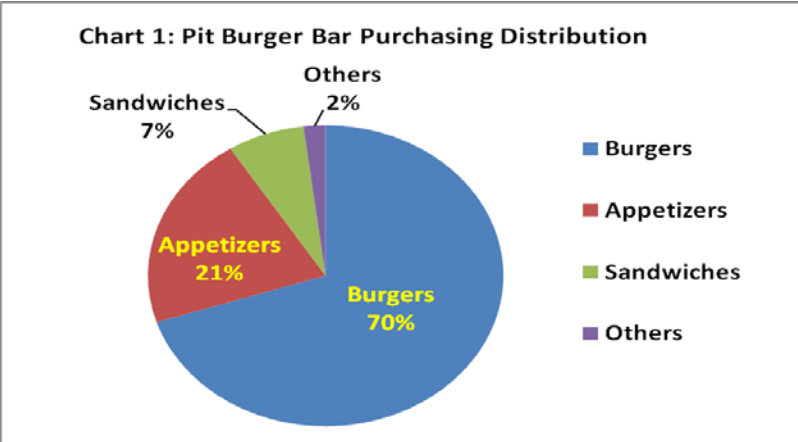


Chart 1: Pit Buger Bar Purchasing Distribution

Chart 1 shows that the purchasing level of burgers is the highest with 70% ($\pm 7.55\%$), and it is followed by appetizers with 21% ($\pm 6.71\%$). As for sandwiches and other menu items, they each take up 7% ($\pm 4.20\%$) and 2% ($\pm 2.31\%$), respectively. We designed this question to find out the food item that were purchased the most. These values would be combined with the EF values to decide whether to alter one of the options on the menu or to introduce a new one.

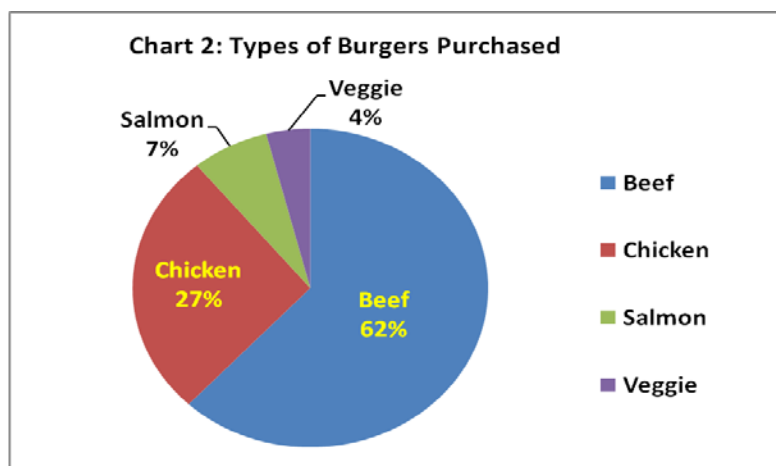


Chart 2: Types of Burgers Purchased at the Pit Burger Bar

Out of the 70% of burgers purchased, Chart 2 shows the distributions of each type of burger purchased. Beef burgers are purchased the most at 62% ($\pm 8.00\%$), chicken burgers at 27% ($\pm 7.32\%$), salmon burgers at 7% ($\pm 4.20\%$), and vegetarian burgers purchased the least at 4% ($\pm 3.23\%$).

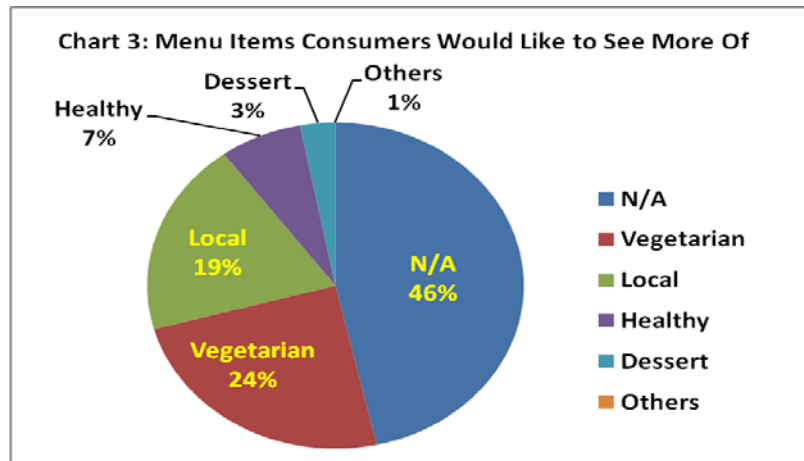


Chart 3: Menu Items Consumers Would Like to See More Of

Chart 3 shows the distributions of the feedback provided on the surveys about what types of menu items or ingredients consumers would like to see more of at the Pit Burger Bar. Suggestions were categorized into five main groups, 46% ($\pm 8.21\%$) of the survey participants did not give comments. Regardless, other participants who wanted more vegetarian products lead at 24% ($\pm 7.04\%$), more local ingredients at 19% ($\pm 6.47\%$), healthier products at 7% ($\pm 4.20\%$), more desserts at 3% ($\pm 2.81\%$), and other suggestions at 1% ($\pm 1.64\%$).

Discussion of Survey Results

As chart 1 shows, the purchasing level of burgers takes up 70% ($\pm 7.55\%$) of the overall purchasing distribution at the Pit Burger Bar. In addition, chart 2 shows that out of all the burger selections available, beef burgers are the most purchased with 62% ($\pm 8.00\%$) while vegetarian burgers are the least purchased with 4% ($\pm 3.23\%$). Combining charts 1 and 2, we would suggest implementing changes in the beef burgers since it is the most popular food item. Also, considering that beef has the highest EF according to the ranking table mentioned above (p. 9), it would be meaningful to develop a new beef burger

that has a lower EF. However, due to the fact that the other group in our scenario had already decided to work on the burgers of the Pit Burger Bar, we did not want to have a similar proposal for Donovan. We felt that changing the recipe of the beef burgers even slightly would be a risky thing to do because it is the staple of the Pit Burger Bar in which, as supported by the survey, has a high consumer demand. Although the AMS would like to use beef that is as local as possible, they still need to take into account the price of the beef they are purchasing because the volume of beef orders are usually quite large compared to other produce. Therefore, considering that appetizers have the second highest purchasing level from chart 1, and the fact that consumers would like to see more vegetarian and local food items from chart 3, we decided to propose the addition of a vegan appetizer on the menu. We came to this conclusion in hopes of decreasing the consumption level of other Pit Burger Bar appetizers with higher EFs. For example, menu items such as nachos and poutine are both considered to have a higher EF because they contain cheese, which has the second highest on our EF ranking of the Pit Burger Bar menu items.

Incorporating New Vegetarian or Vegan Options

Consumers are often mistaken in that they believe that the distance food travels is the major contributing factor to the high EFs of foods; It is actually the food's production and packaging methods that must be considered (Randerson, 2007). Growing methods include the land that must be used or cultivated, the type of feed and the type and amount of herbicides and pesticides needed to grow food. Randersen (2007) explains that when comparing growing methods of vegetables and meat, growing animals is clearly much more energy and land intensive than growing vegetables. For example, cattle ranches produce

37% of the total methane caused by human activity, and methane is calculated to cause 23 times more global warming than carbon dioxide emissions (Down to Earth, 2010). And by comparison, a plant-based diet would immediately reduce an average person's agricultural land share by approximately 75% as opposed to a meat-based diet (Miner, 2010). In our case, using apples to make apple fries means that it will have a significantly lower EF of 0.15gha/capita, whereas, meat production will usually have an EF of 0.38gha/capita (Frey & Barrett, 2007).

Thus, by offering the apple fries, we will be adding more variety to the vegetarian section on the menu. Not only will this addition potentially draw in more vegetarian and vegan consumers, as well as keep the interest of omnivorous consumers, it will also draw consumer's attention to vegetarian and vegan diets that are far less ecologically damaging.

Local Ingredients

Wherever possible, the distance food travels should be reduced to lower the EFs of food items. Sourcing from local producers not only can reduce this distance but also reduce the amount of processing and packaging of the food item when it is travelling from one place to the next; this conventional method of sourcing and transportation produces large amounts of waste and uses up significant amounts of fuel creating a negative impact on the environment (Bentley and Barker, 2005). In order to steer the Pit Burger Bar away from sourcing food from far away, we have contacted several local apple suppliers, who said that they would be delighted to deliver the required amount of apples that the Pit Burger Bar would need. This is excellent news for our project because Randerson (2007) states that the majority of EF usually comes from processing methods and conditions of food;

therefore, if our apples do not need extra processing, we are certain to have an even lower EF. Other than the minimal processing involved in preparing apple fries, we chose apple fries as our recipe because the recipe's main ingredient, the apple, is supplied regularly to AMS venues. Apples can also be obtained from BC producers who meet the AMSFBD dependability, quantity, quality and cost requirements (Lewis, 2009). We started off by contacting the UBC farm because it is the farm that is closest to UBC and it also supplies local food. However, we found that their apples are costly (\$2.5/lbs) (McNeill, 2010). Therefore, we contacted the Hidden Springs Farm, which was recommended by a procurement report (Lewis, 2009). According to the report, the farm, which is run by Tom Sullivan - a UBC Agroecology professor, meets the AMSFBD dependability, quantity, quality and cost requirements (Lewis, 2009). The cost of the apples was quoted as \$0.50/lbs, which is significantly lower than price of apples at the UBC farm (Sullivan, 2010). Mr. Sullivan also said that he would be willing to deliver any number of boxes of apples needed by the Pit Burger Bar (Sullivan, 2010).

Apple Fries Recipe

From our analysis of the Pit Burger Bar menu, we saw that many of their appetizers contained cheese and are made from processed vegetables. Since cheese was ranked as having the second highest EF and processed vegetables have a higher EF than local fresh vegetables, the appetizers have a relatively high EF. Since our objective is to meet the consumer demand while lowering the EF of Pit Burger Bar food items, we proposed the addition of deep fried apple fries made from local apples. According to our survey results, this recipe should receive a high demand from consumers. By adding this recipe to the menu, our intention is to make the apple fries from local and, potentially, organic BC grown

apples. In addition, since the fries are usually served alongside the burgers, we thought that it would have a significant impact in the long run due to the large volume of burgers being sold daily at the Pit Burger Bar.

Limitations of our Project

One limitation for this project is that for the last question on the survey (Appendix A), some customers might not have understood the term Ecological Footprint. The lack of understanding of the term might have contributed to the unresponsive or irrelevant answers. Our survey could be improved by defining the term and also by specifying that it is in relation to the menu items, so that we might be able to obtain more relevant suggestions that are targeted to our project's focus. Another limitation is the communication barrier between the Pit Burger Bar's manager and our team. Ideally, we would have liked to conduct a taste test for the apple fries recipe with the Pit Burger Bar's staff; however, we were unable to organize a meeting time that was appropriate for both parties. It was also brought to our attention that although the recipe worked best with Fuji apples, that this variety is not grown by Hidden Springs Farm.

RECOMMENDATIONS

Recommendation for the AMS Sustainability Coordinator

- **Recommendation:** We recommend that AMS Sustainability Coordinator source the apples directly from the Hidden Spring Farm.
- **Reason:** According to the Report and Recommendations from Sustainable Produce Procurement Liaison, Hidden Spring farm has met the AMSFBD dependability, quantity,

quality and cost requirements. This farm would be a great potential partner for the AMS because not only can it provide large quantities of apples, Hidden Spring Farm also can offer them at a lower price at \$0.50/lbs compared to the UBC farm for \$2.50/lbs.

- **How:** Tom Sullivan, the owner of the farm, is a professor from UBC Agroecology faculty.

Recommendation for the AMS Sustainability Coordinator

- **Recommendation:** We recommend that the AMS Sustainability Coordinator to develop a storage room to be able to store local apples.
- **Reason:** The main problem with sourcing from local apple producers is that apples are only harvested in August through October. Without a specialized storage room, the apples would not stay fresh for a very long time. In addition, local apples bought directly from the farm are much cheaper than having to buy from marketers, in which marketers have a storage room where they store enough apples to be sold for the whole winter season in a specialized storage room. As a result, a specialized storage room can potentially be developed to store local apples so that local apples can be supplied throughout the year in UBC at a low price. This not only reduces the cost for venues but also for the students and staff of UBC who purchase apples or apple products on a daily basis. However, it is important to consider the volume of apples that are bought throughout the year through AMS to see how big of a demand there is for local apples.
- **How:** Something future LFS 450 students might be able to help with. Possibly conduct a survey to see whether there is a demand for local apples from UBC students and staff of the venues.

Recommendation for Pit Burger Bar

- **Recommendation:** We recommend that the Pit Burger Bar increases the variety of chicken, salmon and vegetarian burgers to compensate for the overly dominating menu selection of beef burgers.
- **Reason:** Beef is considered to having the highest ecological footprint among most, if not all, foods (Collins, A., Fairchild, R., 2007). In comparison, chicken, salmon and vegetables have a significantly lower ecological footprint than beef (Collins, A., Fairchild, R., 2007). By substituting beef with chicken, salmon, and vegetables in the burger, it can significantly lessen the ecological footprint of the Pit Burger Bar, especially when such large volumes of beef burgers are being sold daily.

Recommendation for Pit Burger Bar

- **Recommendation:** We recommend that the Pit Burger Bar give a special that offers the option of apple fries made from local apples that go along with each burger instead of potato fries.
- **Reason:** By pairing apple chips made from local apples with the burgers, it would help lessen the ecological footprint of each burger dish. Studies have shown that by reducing food miles of food commodities consumed by the public can significantly lower carbon emissions (Bentley and Barker, 2005). In addition, this could potentially attract more vegan and vegetarian consumers to the venue.
- **How:** We suggest developing posters that showcase that the apple fries are made from local apples. A good marketing strategy to grab attention to the new product could be to

cut the apple into a spiral shape using a spiral slicer

(<http://www.kasbahouse.com/villawareonline/gratersandchoppers.asp>) before frying it. This could potentially spark the interest of consumers that do not purchase food from the Pit Burger Bar.

Recommendation for Future LFS 450 students

- **Recommendation:** We recommend that future LFS 450 students continue with the project that we have started to ensure that the Pit Burger Bar can successfully implement the addition of apple fries in their menu. This includes sourcing local apples that work well with this recipe, conduct a taste testing with the Pit Burger Bar staff, conduct a survey to ensure that there is adequate demand for the apple fries and possibly sourcing the spiral apple slicer for marketing purposes.
- **Reason:** We feel that because this is the first Food Systems Project that has worked with the Pit Burger Bar, there is still a lot room for improvement and a lot of creative ways to reduce the venue's ecological footprint.

CONCLUSION

Since this is one of the first contributions made to reduce the Ecological Footprint of the Pit Burger Bar, continued cooperation and partnership between the Pit Burger Bar and the UBC Food System Project is necessary to facilitate its transition into a more sustainable venue.

REFERENCES

- Bentley, S., & Barker, R. (2005). *Fighting global warming at the farmers' market: The role of local food systems in reducing greenhouse gas emissions*. Retrieved from <http://www.foodshare.net/resource/files/foodmilesreport.pdf>
- Collins, A., & Fairchild, R. (2007). Sustainable food consumption at a sub-national level: An EF, nutritional and economic analysis. *Journal of Environmental Policy & Planning*, 9(1), 5 – 30.
- Compass Food Canda. (2008). *Purchasing*. Retrieved from https://www.dineoncampus.ca/Documents/ell/Corporate%20Sustainability/SustPurchasing_FINAL1.pdf
- Down to Earth. (2010). *Top 10 Reasons Why It's Green to Go Veggie*. Retrieved from <http://www.downtoearth.org/environment/top-10-reasons>
- Environment Canada. (2008). *Reduce your ecological footprint*. Retrieved from <http://www.ec.gc.ca/education/default.asp?lang=en&n=27763D25-1>
- Frey, S., & Barrett, J. (2007). *Our health, our environment: The ecological footprint of what we eat*. Cardiff: International Ecological Footprint Conference.
- Gill, B. (2005). *Z-squared: The impact of food*. Wallington, Surrey: BioRegional Consulting Ltd.
- Hospitality Services. (2009). *Hospitality services local sustainability plan*. Retrieved <http://www.hospitality.uoguelph.ca/sustainability/downloads/HospitalitySustainabilityInitiatives.pdf>
- Kitzes, J., Peller, A., Goldfinger, S., & Wackernagel, M. (2007). *Current methods for calculating national ecological footprint accounts*. *Sciences for Environment & Sustainability Society*, 4, 1-9.
- Lewis, D. (2009). *Report and recommendations from sustainable produce procurement liaison*. Retrieved from http://www2.ams.ubc.ca/images/uploads/5Produce_procurement_report012309.doc
- Miner, R. (2010). *Our ecological footprint*. Retrieved from <http://www.lightfootcycles.com/footprint.php>

- People for the Ethical Treatment of Animals. (2010). *Eating your way to a smaller 'ecological footprint'*. Retrieved from <http://www.goveg.com/environment-wyced-footprint.asp>
- Princen, T. (2002). Distancing: Consumption and the severing of feedback. In T. Princen, M. Maniates & K. Conca (Eds.), *Confronting consumption* (103 – 131). MI: MIT Press.
- Randerson, J. (2007). *The eco-diet...and it's not just about food miles*. Retrieved from <http://www.guardian.co.uk/uk/2007/jun/04/lifeandhealth.business>
- Rees, W.E. (2001). *Ecological footprint of farmed and caught salmon*. Retrieved from <http://www.georgiastrait.org/?q=node/446>
- Santa-Barbara Family Foundation. (2003). Ecological footprint. Retrieved from <http://www.sustainablescale.org/ConceptualFramework/UnderstandingScale/MeasuringScale/EcologicalFootprint.aspx>
- UBCFSP Scenario, 2010. *The University of British Columbia Food System Project (UBCFSP)*. University of British Columbia: BC, Canada.
- University of Western Ontario. (2009). *Green report card 2010*. Retrieved from <http://www.greenreportcard.org/report-card-2010/schools/university-of-western-ontario/surveys/dining-survey>
- University of Alberta. (2010). *Acts of green*. Retrieved from <http://www.augustana.ualberta.ca/sustainability/programs/>
- Wackernagel, M., & Rees, W. (1996). *Our ecological footprint*. Gabriola Island, BC: New Society Publishers.

APPENDIX

Appendix A: Survey distributed in the S.U.B

1. Please indicate your relation to UBC:
Student Faculty / Staff Other: _____

2. If you answered student or faculty/staff, please indicate what faculty you are with:
Arts Sciences Commerce Engineering

Land and Food Systems/Forestry Other: _____

3. What is your diet?
Omnivore (Eat everything) Vegetarian Vegan

4. Have you ever purchased food from the SUB?
Yes No

5. If yes, have you ever purchased food from the Pit Burger Bar?
Yes
 If yes, what do you usually purchase? _____

No
 If no, what are your reasons for not purchasing? _____

6. Are you satisfied with the Burger Bar's current menu?
Yes

No
 If no, do you have any suggestions for additional menus? _____

7. If vegan items or more vegetarian items were to be added to the menu, would you be more willing to purchase food from the Burger Bar?
Yes No Does not change my preference

8. If vegan / vegetarian items were added to the menu, would you tell others about it?
Yes No Maybe

9. Have you tried the Burger Bar's vegetarian burger?
Yes No

10. If "Yes" was your answer to question 9, did you enjoy the burger?
Yes No

If you have any comments or suggestions, please specify below:

Appendix B: Apple Fries Recipe (per apple):

1 medium size apple, peeled and cut into 0.5cm wedges
2/3 cup flour
3 tbsp sweet rice flour
3 tbsp cornstarch
1 1/4 cup cold water
2 tsp baking powder
2 tbsp vegetable oil

Mix all dry ingredients. Then add water and mix until even consistency. Add vegetable oil to batter mix. Allow batter to set for 1 hour. Dip and evenly coat the apple wedges in the batter mixture. Ensure frying oil temperature is at 375°F. Place coated apple wedges into frying oil and cook until golden yellow or approximately 1-2min.

Appendix C: Interview Responses from the Interview with Donovan Larson

Meeting With ^BDonovan Larson @msn.com.

1. What procedures or steps have you taken to reduce your carbon and ecological footprint?
 - veggie burger from Langly
 - salmon burger (wild) on regular menu
2. What are you hoping to get out of this project?
 - open to anything as long as it suits the venue and it's pricing is within the range that students will pay. (students have to feel like they are getting what they pay for)
3. Are you willing to purchase local or organic ingredients from the AMS if they were available?
 - Yes!
4. What is the budget for the development of a new menu item or altering current menu items or ingredients? Who would be the best person to talk to about budgeting?
 - not necessarily a budget - everything is pretty feasible as long as students are willing to pay for the food item.
5. Would you be comfortable with us making a survey for your venue regarding consumer preferences?
 - Absolutely. It would be useful for Donovan as well since he does not have time to do one himself. We may want to provide him with the results
6. Is it feasible to suggest a menu item that requires equipment available in the SUB kitchen or would you rather see a menu item that can be prepared and cooked in the Pit Burger Bar kitchen?
 - Yes, they already use the other kitchen and so it is possible.
7. We understand that there is currently a vegetarian burger on the menu, could you tell us whether the patty is local?
 - Langly.
8. Any suggestions on what you would like to see?
 - menu item with minimal prep if possible

Look into the packaging and the equipment available. This will help us with finding an appropriate recipe.

- small medium & large dishes + plate + cups for fries
- can source other types of packaging

Informed Consent Participants (115)

| | | | |
|------------------|--------------------|------------------|-----------------|
| Geoff Canu | David Lu | C.L. | Michael Hsieh |
| Jessie Au | Cirline Han | J.A. | Minnie Lee |
| David Yang | Ashley Tisseur | L.C. | Nicholas Levitt |
| Jahn Oschstaff | Justin Ling | Ada | Jessica W. |
| Oliver Leung | Mark Renee | D. Lee | Janice Tan |
| Robert Lee | T. Coutts | Yili | Larry Au |
| Uime Leqault | Kacper Petrykowski | J.N. | Albert Lau |
| Sarah Gerrard | Katie Macpherson | Michitaka Mizuno | Stella Ng |
| Joshua Intensity | Dawn Thomas | Lucinda | Anna Chang |
| Pue Moojsha | Sherona Chan | Katie | Allister Green |
| Albert L. | Steven Pi | Daryll Sy | Brent Anderson |
| Vicki Lee | Vivian Chu | Jeff Wong | |
| Marilyn Pham | Elenanor Stevens | Semar Lazani | |
| Sarah Chin | Kent Jay | Jessica Van | |
| Tony Parona | King Tianian | D. Lin | |
| Venus Tong | Mark Bleackley | J.D. | |
| Wilson Cam | Shal Bnam | L.M. | |
| Willis Flett | Bruce Lam | Ran Qin | |
| Jason Cheung | Alexis Bille | Lauren Gibson | |
| Ken Hui | Shania Beyel | Michelle Z. | |
| Peter Adam | Donha Paric | J.S. | |
| Warran Hui | Rebecca Slaven | Pedram Moussani | |
| Jennifer Chiu | Dan Slessor | L.L. | |
| Mac Thatcher | Julia Nelson | David Levy Booth | |
| Kenny Wilson | C. Gelhooly | Nathan Khan | |
| TJ Lagner | Juan Carlos Mendez | Eunjin Seo | |
| Derrick Mezzone | Heidi Dann | Sunny Hahm | |
| Matt Umemura | Jarez Griffin | Yvonne Dang | |
| Lina L. | Matthew Cha | Jennifer Ku | |
| Anna Ahn | Ali B. | Omar Varani | |
| Lana Mchale | Wette Wong | Anna Lin | |
| L.D. | Kelvin Yeung | Brittany Conlon | |
| Bardia Ghassemi | Vivian Liu | Katie Huston | |
| Moh Mehrabi | A. Brian | B.M. | |