

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

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

The Pit Burger Bar

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Scenario 5: Exploring Ways to Lighten AMS Food and Beverage Department's Ecological Footprint

The Pit Burger Bar

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Abstract

Through the increase of awareness on diminishing global resources, the importance of ecological footprint on human activities has been brought to light. This project is a subset of the UBC Food System Project and it aims to work with the Pit Burger Bar of the AMS Food and Beverage Department to reduce the venue's ecological footprint. It incorporates background research using primary literature on assessing the relative ecological footprint of the menu items currently offered by the Pit Burger Bar, interviews with the AMS representatives, a customer preference survey as well as recipe creation. AMS Food and Beverage Department is supportive of this project's goals and is willing to collaborate with us and make feasible changes to the food outlet. Ecological footprint assessment showed that plant-based diets usually have a higher energetic efficiency, lower ratio of energy input to energy output and smaller amount of greenhouse gas emissions compared to meat-based diets. Survey results revealed that the most popular item at the Pit Burger Bar is the beef based burger. Our group proposes that the Pit Burger Bar makes modifications to the existing menu as well as introduces new LOV items in hopes of altering customer preferences to more plant-based products, thus lowering the ecological footprint of the Pit Burger Bar. Recommended changes to the Pit Burger Bar are to source the veggie burgers locally, to launch new LOV items such as vegetarian chicken strips with varieties of dipping sauces and to offer a seasonal curry item served with roti. The manufacturer for the recommended menu items that need to be purchased and cannot be homemade has been contacted, and has agreed to supply the venue should there be enough demand. This project serves respectful recommendations for the Pit Burger Bar's future operations in targeting for a lighter ecological footprint and we, the members involved in this project, would be delighted to see our suggestions be implemented in the near future.

Introduction

In the past 20-30 years, the earth has seen a surge of growth in population. Last year, in 2009, the world population was recorded to be at approximately 6.8 billion and looking at the trend of growth rates in the past, it is estimated to reach 8 billion by the year 2025. Population growth along with consumption is a threat to global food security as well as sustainability. This increase in population is causing depletion of vital resources such as water and land. Conflicts for possession of remaining resources have been observed as well, threatening both the social and economic sustainability of our planet. Environmental impacts caused by the growing population and the human activities that accompany the growth are also causing negative climate changes. In order for us to sustain ourselves with the amount of resources we have left, the ecological footprint of each individual needs to be reduced. To accomplish this goal, our everyday decisions on what we choose to consume plays a key role. Farm Folk, City Folk revealed in 2008 that a daily meal “contains ingredients from 5 countries in addition to our own” on average (FarmFolk/CityFolk Society, 2008). It has come to light that “food is now also the largest component of airfreight, the most polluting form of transportation” (FarmFolk/CityFolk Society, 2008). The David Suzuki Foundation suggests individuals to eat locally as well as eating lower on the food chain in order to lighten their ecological footprint (David Suzuki Foundation, 2008). Other than the recommendations above, it has been proposed that consumption of organically produced foods and foods with less processing and packaging will help reduce our ecological footprints. According to a various numbers of studies, there is a positive correlation between eating locally and/or organically with human health.

In the beginning of 2007, the AMS Environmental Sustainability Policy (AMSESP) was passed by the AMS Council. This policy called for the creation of a new strategy, the “AMS

Lighter Footprint Strategy” (AMSLFS). The strategy aims for reduction of “the university campus’s Ecological Footprint (EF) to sustainable levels and to foster environmental justice in our own operations and through our relationships within the University and the broader community” (Doherty & Stein, 2007). This strategy is anticipated to increase the level of sustainability on UBC campus and to act as a prototype for other organizations and institutions in the long run. In the past 2 years, the LFS 450 students have developed and implemented multiple schemes under the AMSLFS. Such plan of actions comprise of advanced menu items that have lighter footprints by integrating local, organic and vegan products. Examples of menus include vegan baked goods, seasonal local salads, local organic apples and pears and so on. Products with such characteristics were then placed with a corresponding signage now referred to as the “LOV – Local, Organic and Vegan” line. The former LFS 450 students also put an “Eco-Friendly Day” into effect and this day is now conducted every last Thursday of the month in the Student Union Building (SUB). As LFS 450 students, our ultimate objective is to gain as much involvement as we can from students, faculty members and staff to making eco-friendly decisions in their daily lives.

The goal of this scenario is to help the AMS representatives expand the “AMS Lighter Footprint Strategy” through working with AMS food outlets. Students will research ways to lighten the ecological footprint of these outlets through changes in menu items, ingredients, packaging and so on. Examples of recipes that have a “lighter footprint” include no dairy, no-meat, seasonal, local and/or organic items. These menu items can then be added to the LOV line previously developed by former LFS 450 students.

Problem Definition

Seeing the current condition our planet is in, and seeing our school is supportive in striving for a more sustainable environment, it is important that we start reducing our ecological footprint starting from sources closest to us such as the food outlets on campus. The scenario 5 groups worked with the Pit Burger Bar, Honour Roll and the Moon. Our group, along with group 20, specifically worked with the Pit Burger Bar and, thinking within their current customers as well as potential new customers in mind, researched and established menu items that we believe would help lighten the Pit Burger Bar's ecological footprint.

The Pit Burger Bar, being a fast food type venue, has a lot of room for improvements when it comes to reducing their ecological footprint. Due to the nature of this type of food outlet, their current menu consists mainly of meat-based products, which causes them to have a fairly heavy ecological footprint. We see this project as an opportunity to shift customer preferences from the high demand meat-based products to products with lighter ecological footprints such as plant-based products and others that we could add to the LOV line.

Value Statement and Identification of Value Assumptions

The vision statement for a sustainable UBC Food System illustrates a potential ground for equal exchange of social values, nourishment and culture principles. The land nourishes its local inhabitants with distinct seasonal produces and the waste generated is composted back into the soil; more importantly these exchanges serve the interest of local demands only. This balanced framework of give and take is also the goal of our group. Our group's values assumption encompass creating a sustainable campus food system which can serve as a microcosm or a benchmark to the greater Vancouver community's food system. We hope to see all the UBC food venues to source their ingredients from as many local producers as possible

and/or to feature seasonal items. We also feel that consumers as well as producers must be responsible for the food chain and all should be educated on the ecological impact of mass production while understanding the nature of our food system. Recognizing the nature of capitalism and the limitations of operating a business, our groups believe that achieving the standards outlined in the vision statement for a sustainable UBC food system proves to be a very difficult task (Rojas, et al., 2007). This is largely due to the conflicts of interest amongst faculty members and students from this multidisciplinary campus. Please also refer to Appendix I for the vision statement for a sustainable UBC food system (Rojas, et al., 2007).

Denying one's diet preference is in no question a violation of freedom of choice. Currently, the food outlets found on UBC campus are not solely operated by the AMS Food and Beverage Department, which poses a conflict in terms of sourcing local ingredients, as stated in the first guiding principle. Also, franchises such as A&W have relatively fixed prices for their featured menu items which are unlikely to change due to A&W's corporate profit orientation and/or sales strategy. This point is again in conflict with the seventh guiding principle where providers and growers pay and receive fair prices. In short, our group feels that as long as there is a demand for fast food restaurants on campus, and as long as there is a business incentive, one cannot deny the existence of such venues on our campus ground although they may be against the values or guiding principles of the UBCFSP.

Realistically, our group envisions that we make recommendations to the management team of the Pit Burger Bar on ways to reduce the ecological footprint of the venue via menu modification. This vision differs from the extreme standpoint where all products must be produced and composted locally. Instead, we will focus more on taking actions in areas that we identify can further be improved to achieve a more sustainable system. In the context of our

scenario, we plan on helping the Pit Burger Bar on reducing its ecological footprint by sourcing more local ingredients and creating potential substitution menu items that would hopefully lower the demand for products such as beef patties which consume higher energy during production. This is in line with our values and visions where we hope to make a business more sustainable, while making sure not to convert it into an entirely different operation.

Methodology

Background research and discussion

Previous reports were reviewed to find out ways to reduce the ecological footprint. It is the first year for the Pit Burger Bar to participate in the UBCFSP. Various strategies were discussed on how to reduce the ecological footprint of the Pit Burger Bar. We discussed about renewing the packaging materials to locally-made packaging materials, and also to encourage customers to bring their own containers. We contemplated modifying one of their current items by incorporating ingredients that are local, or ingredients that require less energy to produce. Our final idea was to create new items for the Pit Burger Bar. We knew the new recipes would have to fit within the style of foods currently available at the Pit Burger Bar.

Interviews with AMS representatives

We met with the manager of the AMS Food and Beverage Department, Nancy Toogood, and the manager of the Pit Burger Bar, Donovan. We discussed about what some of the approaches and ideas that the AMS or the Pit Burger Bar had previously done on reducing the ecological footprint. We also discussed with reference to what their expectations were for this project.

Survey

A survey was conducted to determine the customer preference and market potentials for a LOV (local, organic and vegan) item at the Pit Burger Bar. Please refer to Appendix II for the survey. We felt this survey would help us design a feasible LOV item for the Pit Burger Bar. 100 participants took place in this survey. The survey was conducted in the Student Union Building, specifically in the areas near various food outlets. We chose to conduct the survey at the Student Union Building because it was the most appropriate location where we could find target-customers as well as current-customers of the Pit Burger Bar.

Recipe Research

We reviewed the Pit Burger Bar's current menu and identified the popular items. The basis of our research was to find an LOV recipe that is simple and also fitting with the Pit Burger Bar. Recipes and products of Garden Protein International were highly considered. This was due to the fact that their products contain organic ingredients, which are also non-genetically modified and certified by vegan action (Garden Protein International, 2009). Furthermore, these products are made locally in Richmond, B.C. (Garden Protein International, 2009).

Ecological Footprint Ranking

One of the main objectives of our scenario is to reduce the ecological footprint of the Pit Burger Bar. Therefore, our group decided to analyze the Pit Burger Bar's menu by ranking specific items based on their ecological footprint that is left during their production stages. The specific items that were chosen for the ranking analysis include different patties in the burgers such as beef, chicken and salmon. In addition, some veggies such as soy and potatoes were analyzed in order to compare the ecological footprint of plant-based diets with the one of meat-based diets. The three indicators that were used in the rankings are energy efficiencies (energy

efficiency = 100 * output edible energy/fossil energy input), ratio of energy input to energy output and greenhouse gas emissions (GHGs) generated by food production and processing through both CO₂ emissions due to fossil fuel combustion and non-CO₂ (methane and nitrous oxide) emissions (Eshel & Martin, 2006). The data were based primarily on existing literature publications.

Findings

Background research

Through background research, we found previous LFS 450 groups have developed seasonal, vegan, or organic recipes in the past for other food outlets, following the concept of the LOV line. We saw that some of these recipes incorporated produce from the UBC farm. In addition, they recommended considering and assessing the economic feasibility of the recipes created, which we felt was a very vital point.

Interviews with AMS representatives

From the interviews, we obtained valuable information for our project. The AMS Food and Beverage Department already had some strategies in lowering the ecological footprints of their food outlets. For example, plastic forks are now placed in a location where customers can no longer take as many as they want, and instead, are provided to customers only when needed. This reduces the amount of plastic wastes produced. LOV items are also implemented in some of the food outlets. Examples of such products include the yam tempura roll at the Honour Roll and the Vegan Shepherd's Pie at the Pendulum.

Furthermore, we learned that there are some local food providers for the AMS Food and Beverage Departments. These providers include the UBC farm as well as Central Foods. We also found out through the interviews that it is possible to introduce new food providers to the AMS

Food and Beverage Department as long as the provider is willing to deliver the foods directly to UBC. However, there still may be some resistance to changing the food provider for items that already have a regular provider.

Survey

A total of 100 people participated in taking the survey. 9 out of the 100 people did not fill out the back page of the survey, which consists of questions number 6 to 10. In order to avoid confusion, we eliminated the 9 out of the results for these questions. It is important to note that 98% of the participants were students and 2% were visitors and/or alumni. The faculties of the students are shown in Figure 1. 94% of the participants were omnivores, 5% vegetarians, and 1% vegan. Most of the participants purchase from the Pit Burger Bar at least once a term (Figure 2). 60% chose a burger as their most purchased item; the most frequently purchased being the beef burger (Figure 3). Please refer to Appendix III and IV for complete survey results and names of participants.

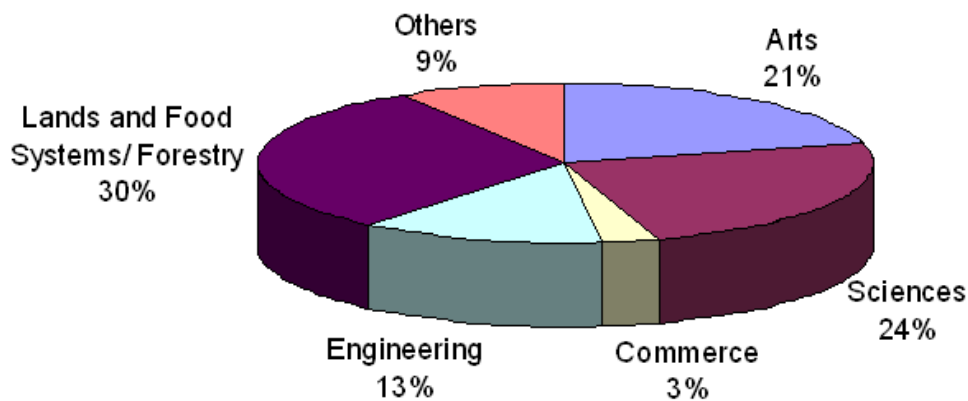


Figure 1. Faculties of the student participants in the survey.

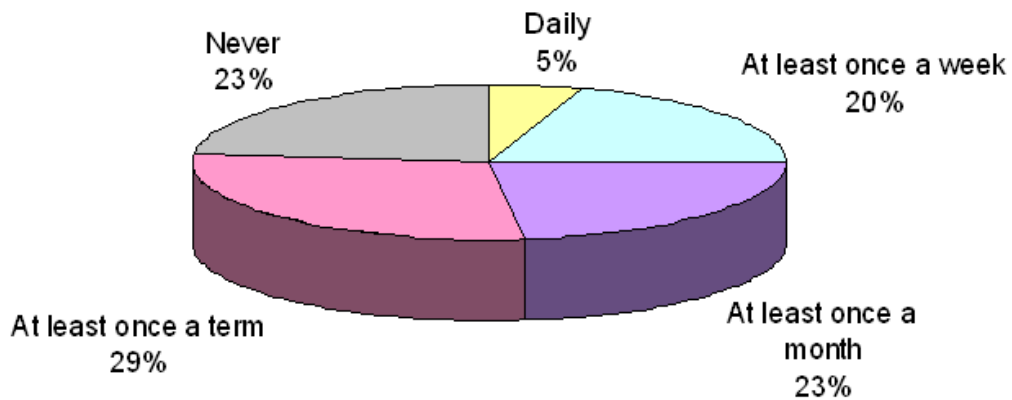


Figure 2. How frequent participants of the survey purchase from the Pit Burger Bar.

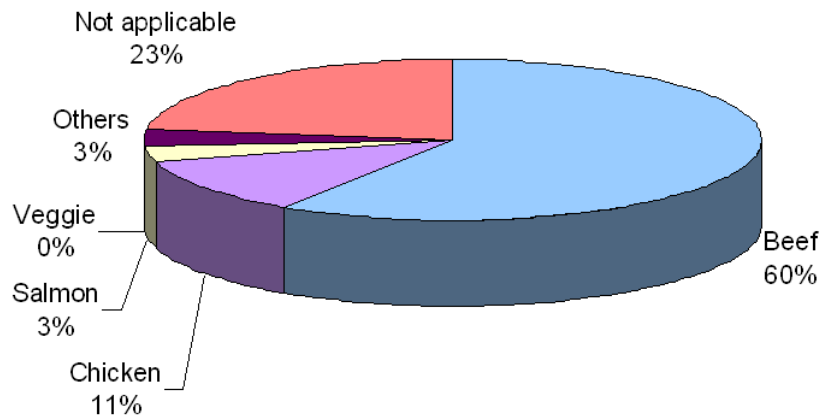


Figure 3. Popularity of burgers at the Pit Burger Bar.

Recipe

There are several possible LOV items that could be implemented at the Pit Burger Bar. They are the following, a local veggie burger, veggie chicken strips, seasonal curry with roti, thai sauce, horseradish sauce and mint dipping sauce, (Garden Protein International, 2009; Great Party Recipes, 2010; CdKitchen, 2010; Group Recipes, 2008; Bella Online, 2010). Please refer to Appendix V for the recipes of these items.

The local veggie burger and veggie chicken strips are both from Garden Protein International, a local producer located in Richmond, B.C. (Garden Protein International, 2009).

The veggie burger is called “Gardein™ Beefless Burger” and the veggie chicken strips called “Gardein™ Seven Grain Crispy Tenders” (Garden Protein International, 2009). They are all made from plant-based ingredients, the recipes incorporating some organic ingredients (Garden Protein International, 2009). A veggie burger is already offered at the Pit Burger Bar so it is already agreed upon as a feasible item. The veggie chicken strips are also fitting with the style of food at the Pit Burger Bar. The various sauces suggested are plant-based and can easily be made with organic ingredients. The curry can be made from seasonal vegetables and served as a quick dip and go item with the easily made roti.

Ecological footprint ranking

An estimated two billion people in the world live primarily on meat-based diets and an estimated four billion live primarily on plant-based diets (Pimentel & Pimentel, 2003). The production, transportation, storage and distribution of both diets require significant quantities of non-renewable fossil energy (Pimentel & Pimentel, 2003). For example, one study which was conducted by David Pimentel and Marcia Pimentel showed that 17% of all the fossil fuel used in the U.S. was from the food production system in 2002 (2003). In addition, for both diets, significant amounts of GHGs are generated during food production, transportation, storage and distribution (Coley et al., 2009). Not only the CO₂ emissions which are related to the fossil-fuel based energy consumption are generated, but the non- CO₂ GHGs such as methane and nitrous oxide emissions that are unrelated to fossil-fuel combustion can also be released (Coley et al., 2009). Thus, both plant-based diets and meat-based diets are unsustainable in the long term due to heavy fossil energy requirements and large amounts of GHG emissions (Coley et al., 2009). However, the meat-based diets require more energy, land and water resources and generate more GHGs than the plant-based diets (Coley et al., 2009). Therefore, in this limited sense, the plant-

based diets are considered to be more sustainable than the meat-based diets (Pimentel & Pimentel, 2003).

Based on our research, we found that plant-based diets usually have higher energy efficiencies compared to meat-based diets (Table 1). Moreover, amongst all the selected food items, salmon had the least energy efficiency, soy having the most (Eshel & Martin, 2006). On the other hand, in terms of the ratio of energy input to energy output, plant-based diets generally have a lower ratio compared to meat-based diets (please refer to table 2). Within the selected foods items, beef had the highest ratio, soy and potatoes having the lowest (Pimentel & Pimentel, 2003). The GHGs (considering CO₂, N₂O and CH₄) generated by both plant-based diets and meat-based diets were also analyzed (please refer to figure 1). In figure 1, each of the five lines represents a semi-realistic mixed diet. From the graph we can see that if people consume the same percentage of caloric input from animal sources in these five diets, the diets that mainly include red meat would have the largest amount of GHG emissions. On the other hand, the diets that mainly include poultry would have the smallest amount of GHG emissions (Eshel & Martin, 2006).

Table 1: Energy efficiencies* for a few representative food items derived from land animals, aquatic animals and plants (Eshel & Martin, 2006)

| Food item | 100 x (Kcal output/Kcal input) |
|------------------|--------------------------------|
| Chicken | 18.1 |
| Beef (grain fed) | 6.4 |
| Salmon (farmed) | 5.7 |
| Soy | 415 |
| potatoes | 213 |

*Energy efficiency = 100 x output edible energy/fossil energy input

The ranking from least energy efficiency to most energy efficiency is:

Salmon → Beef → Chicken → Potatoes → Soy

Table 2. Ratio of energy input to energy output* (Pimentel & Pimentel, 2003)

| Food item | Ratio of E_{input} to E_{output} |
|-------------|--------------------------------------|
| Chicken | 4:1 |
| Beef cattle | 40:1 |
| Fish dishes | Between 8.1:1 and 23:1 |

*One of the factors of the energy intensity of food is that it takes many calories of energy to produce one calorie of energy in the form of meat. For example, it takes approximately 4 calories of energy to produce 1 calorie of chicken. The actual ratio data for soy and potatoes are not known, but the ratio of energy input to energy output for plant-based diets is considered to be lower than the ratio for meat-based diets. (Eshel & Martin, 2006).

Highest ratio of E_{input} to E_{output} to lowest E_{input} to E_{output} ranking:

Beef → Fish dishes → Chicken → Soy/Potatoes

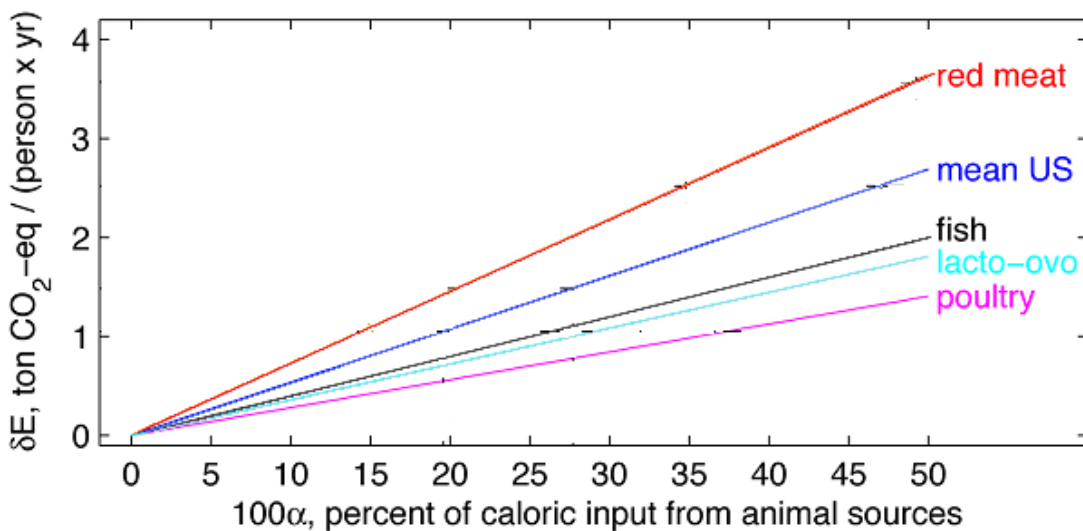


Figure 4. The GHG burden exerted by plant-based and meat-based food productions through both CO₂ emissions due to fossil fuel combustion and non-CO₂ (methane and nitrous oxide) emissions (Eshel & Martin, 2006).

Each of the five lines represents a semi-realistic mixed diet. All of the five diets have the same caloric intake, and all are considered for animal portion of calories. The mean US lines indicates mean US diets, which include both meats and veggies.

Largest amount of GHG emissions to smallest amount of GHG emissions ranking:

Beef → Fish → Soy/Potatoes → Chicken

Discussion

Ecological Footprint Assessment

Ecological footprint is the mathematical measure of humanity's demand on earth's ecosystem (Van Vuuren & Bouwman, 2005). Every human action requires some form of energy that is derived from the earth's resources. Following this concept, assessing the ecological footprint of food production would require an estimation of the amount of land and water required to produce a fixed unit of products for human consumption, as well as a measurement on the impact to the land from production waste. These measurements are elaborate and as a group we did not feel we had the resources and time to generate enough data to construct accurate ecological footprint estimations. Instead, our group decided to assess the menu items of the Pit Burger Bar in a ranking system from high to low using certain menu items' ecological footprints during production. We did not assess the energy consumption of each ingredient of every item due to time limitations. Instead our group selected the core ingredient from the menu, potatoes, beef, chicken, salmon and vegetarian patties, for assessing the ecological footprint. Other ingredients such as burger buns and condiments were not assessed since they are present in almost all items and therefore would not contribute to a significant relative difference in ecological footprint ranking. Our group also made the assumption that a person's diet dictates his/her food choices and therefore assessing the diet can indirectly project an estimation of the ecological footprints from burger bar's food items. For instance, an individual with an omnivore diet is most likely going to order a beef burger instead of a vegetarian burger due to personal preference, additionally given that the purchase is made through a fast food outlet. An individual who has ethical or health concerns towards the origin of foods will most likely avoid purchasing

from a fast food outlet. These assumptions are supported by our survey results, which will be discussed in detail following this section.

The ecological footprints of the core ingredients from the Pit Burger Bar are ranked based on three indicators; energy efficiencies, ratio of energy input to energy output and greenhouse gas emissions. Together these three indicators allowed a rough estimation of which group of food items have heavier ecological footprints compared to others. The results from the indicators are in agreement where the lacto-ovo diet which rely more on plant-based proteins leave relatively lower CO₂-equivalent emission, and that soy alone yields the highest energy efficiency at 415 kcal output/input (Eshel & Martin, 2005). Menu items containing red meat ranks highest in terms of production ecological footprint with 6.4 kcal output/input, or a ratio of 40:1 from energy out/energy input (Pimetel & Pimetel, 2003). Menu items containing fish also have a relatively high ecological footprint with energy output/input ratio of 5.7 kcal, only 0.5kcal lower than beef. However fish production's CO₂-equivalent GHG emission is below the level of red meat's emission (Eshel & Martin, 2005). The data suggests that plant-based, or in the case of the Pit Burger Bar menu items, vegetarian burger would have a lower ecological footprint compared to the beef burger or salmon burger.

In coherence with our case scenario's objective to reduce ecological footprint of the Pit Burger Bar and to promote LOV items, our group concluded that one efficient way to achieve our goal is to shift the consumer demands from high footprint items towards food items that are more local and vegetarian based.

Burger Bar Survey

The Burger Bar consumer preference survey serves the interest of both Donovan, the Pit Burger Bar manager, and our project. This survey is intended to capture the characteristics of

both current and potential customers. Please see Appendix II for the survey questions. Donovan would benefit from this survey by being able to see which items are the most popular at his venue as well as his target consumer group. This information can contribute to future menu planning. Our group wanted to examine which item was the most popular and to suggest a way to reduce the ecological footprint based on this data. The survey also included questionnaires that were directed towards the customers' mentality and demands toward vegetarian food, which is a vital piece of information in terms of introducing more vegetarian products.

This survey was a joint effort between our group and group 20 as both groups were working on the same case scenario with the same food outlet. Each group was responsible for conducting 100 surveys each and a compilation was to be made at the end. However, there were issues of compliance from group 20 as some questions were omitted in their surveys. As a result our group decided to base our findings on the 100 surveys that our group alone conducted. Nevertheless, this switch limited the strength of the survey results as sample size was significantly reduced. Other weaknesses of this survey include sampling bias where some correspondents that were approached had an association with the faculty of Land and Food Systems. Furthermore, our group also experienced non-compliance from nine individuals that failed to fill out the second half of the survey. The strengths of this survey include a low non-response bias as only 6 individuals disagreed to taking the survey out of the 106 approached, yielding a response rate of 94%. Randomized sampling was employed to homogenize the sample pool. While not all the results from the survey were used in this project, the raw data can be seen in Appendix III. Statistical analysis was not performed on the data, as this survey was not intended to determine any correlation, but simply a rough overview of the consumer preferences.

Some data obtained from the nine correspondents who did not complete the second half of the survey, specifically questions 6 to 10, were omitted from our calculations. As illustrated in the findings, the beef based burgers are the most popular items from the Pit Burger Bar, accounting for 60% of all the purchases made by the respondents (Figure 3). The Non-applicable group accounts for 23%, ranking second highest in the food items purchased (Figure 2). This category corresponds to individuals who do not regularly purchase from the venue. The chicken burger ranked in third, followed by the salmon burger along with other items such as fries and other side dishes (Figure 3). To our surprise, out of the 100 respondents, no participant chose the vegetarian burger as a favourite item, though 5% of the respondents were vegetarians and 6 individuals reported trying the vegetarian burger in the past. This seems to suggest that the current vegetarian burger being offered is not popular even amongst the vegetarian patrons. Our group feels that this will be a potential area for modification to promote a new vegetarian patty in hopes of shifting the consumption of beef to vegetarian products, and thereby reducing the total ecological footprint. In addition, this information also shed light into the existing demand for side dishes such as chicken strips or fries. Sourcing more local ingredients or shifting to plant-based products can also improve the footprints of these products.

Recommended Recipe

In summary, based on our survey results, the beef burger was the most consumed food item from the Pit Burger Bar and consequently also had the heaviest ecological footprint. The salmon burger is offered but the purchase rate is low which opens room for discussion as to whether this item should be offered at all (CAAR, 2010). Our group proposes that new vegetarian recipes that could potentially shift the demand of beef burgers be implemented, decreasing the total ecological footprint of the Burger Bar. Seeing as the current vegetarian

burger used at the venue is Money’s® Gardenburger, which is not locally produced, we have sourced an alternative provider for a vegetarian beef burger, the Richmond Company, Garden Protein International (GPI). Making this switch will decrease the transportation footprint on this product. GPI was contacted in person during the duration of this project and the technical director has agreed that there is potential for business collaboration between GPI and the AMS Food & Beverage Department. He has also confirmed that shipping arrangements to UBC campus is possible should the purchase be made. Due to confidentiality reasons the name of the technical director is not released but contact can be made through Frank Yao, a member of our group.

One of our proposed items, the vegetarian chicken strips, serves the interest of patrons who wish to purchase nutritious vegetarian side dishes in substitute for meat-based products. As discussed above this recipe uses the product “Gardein™ Seven Grain Crispy Tenders”, the vegetarian chicken strips produced by GPI (Garden Protein International, 2009). Please see

| Nutrition Facts | |
|---|----------------------|
| Valeur nutritive | |
| Serving Size 2 pieces (51 g) / Portion (51 g) | |
| Amount | % Daily Value |
| Teneur | % valeur quotidienne |
| Calories / Calories 90 | |
| Fat / Lipides 1.5 g | 2 % |
| Saturated / saturés 0 g | |
| + Trans / trans 0 g | 0 % |
| Cholesterol / Cholestérol 0 mg | |
| Sodium / Sodium 260 mg | 11 % |
| Potassium / Potassium 180 mg | 5 % |
| Carbohydrate / Glucides 9 g | 3 % |
| Fibre / Fibres 1 g | 4 % |
| Sugars / Sucres 0 g | |
| Protein / Protéines 9 g | |
| Vitamin A / Vitamine A | 0 % |
| Vitamin C / Vitamine C | 0 % |
| Calcium / Calcium | 4 % |
| Iron / Fer | 15 % |
| Thiamine / Thiamine | 10 % |
| Riboflavin / Riboflavine | 6 % |
| Niacin / Niacine | 10 % |
| Vitamin B6 / Vitamine B6 | 10 % |
| Folate / Folate | 2 % |
| Vitamin B12 / Vitamine B12 | 35 % |
| Pantothenate / Pantothénate | 4 % |
| Magnesium / Magnésium | 4 % |
| Zinc / Zinc | 20 % |
| Copper / Cuivre | 2 % |

Figure 5 for the nutritional table of this product. Complimentary dipping sauces that we have recommended are simple to prepare and feature a variety of tastes to accommodate different consumers. The specific recipes are attached in Appendix V. The recipes were chosen based on the fact that they can easily be made from organic ingredients.

Figure 5. Nutritional Facts of Gardein™ Seven Grain Crispy Tenders

Another recipe that our group would like to recommend is the seasonal curry served with roti. This menu allows utilization of the available seasonal local produce such as winter melon or sweet yam into the curry. Naturally these ingredients can be purchased from the UBC farm, which help to connect the vendors and the students with the land. The roti does not need to be purchased, but rather self-prepared simply from flour and water with a small amount of oil. The menu of the roti and a sample menu of the curry can be found in Appendix V. Our group feels that it is important to reduce ecological footprint, and as stated in the value assumptions, we wish to strive for a more sustainable food system on campus.

Conclusion

In conclusion, we have recommended two new menu items; the vegetarian chicken strips with homemade dips and the seasonal curry served with roti. We have also suggested several alterations be made to the current menu of the Pit Burger Bar. One is to switch from the current imported veggie burger to a veggie burger produced by a local provider and the other is to consider possibly eliminating the salmon burger. We hope our recommendations will be implemented at the Pit Burger Bar and will help reduce their ecological footprint.

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Appendix I: Vision Statement for a Sustainable UBC Food System

Eight Guiding Principles:

1. Must protect and enhance the diversity and the integrity of the natural ecosystem and resources that supports it.
2. Relies on local inputs when possible, where inputs and waste are recycled and/or composted locally.
3. Is a secure system that provides food that is affordable; available; accessible; culturally, ethically, and nutritionally appropriate and safe; and can adapt to changes.
4. Nourishes the present generation to provide for healthy diets that do not compromise the food security of present or future generations.
5. Nurtures feelings of community and promotes enjoyment of food around the food table.
6. Fosters awareness, understanding, and personal responsibility within the community of every component from production to disposal.
7. Contains a balance of imported and local foods that come from socially and ecologically conscious producers to ensure long-term financial viability.
8. Consumers, food workers, and educators are made aware of the reciprocal impacts that the UBC food system has on surrounding food systems.

Appendix II: The Pit Burger Bar Survey

LFS 450 UBC Food System Project
Reducing Ecological Footprint in AMS Food and Beverages Services

Please circle one answer for each question that applies to you the most.

1. Please indicate your relation to UBC:

Student Faculty / Staff Other: _____

2. If applicable, please indicate what faculty you are involved in:

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 you answered yes to question 4, how often do you purchased food from the Pit Burger Bar?

Daily At least once a week At least once a month At least once a term Never

If never, what are your reasons for not purchasing? _____

6. If you answered yes to question 5, which of the following do you purchase most from the Pit Burger Bar?

Burger Sandwiches Appetizers (ex. Fries, Mozzarella Sticks) Others

7. Which of the following burgers do you purchase the most from the Pit Burger Bar?

Beef Chicken Salmon Veggie Others Not applicable

8. 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

9. If vegan / vegetarian items were added to the menu, would you tell others about it?

Yes No Maybe

10. Have you tried the Burger Bar's vegetarian burger?

Yes No

If you have any comments or suggestions regarding reducing the Pit Burger Bar's ecological footprint, please specify below:

Appendix III: Complete Survey Results

#1 Please indicate your relation to UBC:

| Student | Faculty/staff | Other |
|---------|---------------|-------|
| 98 | 0 | 2 |

#2 If applicable, please indicate what faculty you are involved in:

| Arts | Sciences | Commerce | Engineering | Lands and Food Systems/ Forestry | Others |
|------|----------|----------|-------------|-------------------------------------|--------|
| 21 | 24 | 3 | 13 | 30 | 9 |

#3 What is your diet?

| Omnivore | Vegetarian | Vegan |
|----------|------------|-------|
| 94 | 5 | 1 |

#4 Have you ever purchased food from the Sub?

| Yes | No |
|-----|----|
| 99 | 1 |

#5 If you answered yes to question 4, how often do you purchase food from the Pit Burger Bar?

| Daily | At least once a week | At least once a month | At least once a term | Never |
|-------|----------------------|-----------------------|----------------------|-------|
| 5 | 20 | 23 | 29 | 23 |

#6 If you answered yes to question 5, which of the following do you purchase most from the Pit Burger Bar?

| Burger | Sandwiches | Appetizers(ex.fries, mozzarella sticks) | Others | No answer |
|--------|------------|---|--------|-----------|
| 47 | 4 | 16 | 4 | 29 |

#7 Which of the following burgers do you purchase the most from the Pit Burger Bar?

| Beef | Chicken | Salmon | Veggie | Others | Not applicable | No answer |
|------|---------|--------|--------|--------|----------------|-----------|
| 52 | 10 | 3 | 0 | 3 | 20 | 12 |

#8 If vegan items or more vegetarian items were to be added to the menu, would you be more willing to purchase food from the Pit Burger Bar?

| Yes | No | Does not change preference | No answer |
|-----|----|----------------------------|-----------|
| 25 | 14 | 49 | 12 |

#9 If vegan/vegetarian items were added to the menu, would you tell others about it?

| Yes | No | Maybe | No answer |
|-----|----|-------|-----------|
| 23 | 31 | 37 | 9 |

#10 Have you tried the Burger' Bar's vegetarian burger?

| yes | no | no answers |
|-----|----|------------|
| 6 | 83 | 11 |

Appendix IV: Participants of the Survey

Participants of the survey who agreed to have their names released:

| | | |
|-----------------|-------------------|------------|
| Tiffany Chu | ZiVin | Hilda Wang |
| Yang Yang | Helen He | |
| Wei-I Tseng | Ben Cochran | |
| Richmond Yu | Nazlee Tabarsi | |
| Jenny Chan | Samuel Tsui | |
| Leo Huang | Lewis Zhen | |
| Yusuke Soga | Nlinqi Zhang | |
| Kyron Harvett | Mandy Huang | |
| Mayan Hrbr | Wu Tong | |
| Winnie Cheung | Zamayaki Houki | |
| Candy Chang | Praveen | |
| Amy Lo | Kevin | |
| Alan Kwok | Jon Dehouwer | |
| Caroline Li | Hillary Topps | |
| Jolly | Jeremiah Bullfrog | |
| Martha Doe | Judy Xu | |
| Brittany Doe | Rebecca Chan | |
| Evans Lam | Michael Harrhy | |
| Robert Chan Bao | Wendy | |
| Garrie | Karen Ng | |
| Gary Kwan | Kayley Fesko | |
| Jen Hsu | Shoko Agawa | |
| Jennifer Huang | Amanda Dse | |
| Kevin Lee | Patricia Kousdie | |

Appendix V: Recipes

A. Gardein™ Beefless Burger

Ingredients:

- Gardein™ Beefless Burger

Procedures:

- Sauté from frozen: 3 minutes on each side until brown, cover and keep on low heat for 4 to 5 minutes, let rest for one minute to serve. (Ensure the internal temperature reaches a minimum of 74 degree Celsius)

B. Gardein™ Seven Grain Crispy Tenders

Ingredients:

- Crispy Tenders

Procedures:

- Reheat in oven (Ensure the internal temperature reaches a minimum of 74 degree Celsius).

C. Horseradish Sauce

Ingredients:

- 4 teaspoons prepared horseradish
- 2 tablespoons lemon juice
- 1/8 teaspoon cayenne pepper
- 1 1/4 cups sour cream
- Salt and pepper to taste

Procedures:

- Whisk together all ingredients until well blended. Chill. This sauce may be prepared up to 5 days in advance. Makes 1 1/2 cups.

D. Mint Dipping Sauce

Ingredients:

- 1 cup plain yogurt
- 1/4 cup fresh mint, chopped
- 1/4 cup finely chopped green onions
- 1/2 teaspoon garlic, minced, or 1/4 teaspoon dry
- 2 teaspoons minced fresh ginger

Procedures:

- Combine all ingredients in a small bowl. Chill. Makes about 1 1/2 cups.

E. Curry with Roti

Roti Ingredients:

- 2 1/2 cups all purpose flour
- 2 teaspoons baking powder
- 1 tablespoon butter
- 3/4 cup of water
- 1 cup oil

Roti Procedures:

- Sift 2 cups of flour, add baking powder and butter, mix well.
- Add water, knead, and make soft elastic but not sticky dough.
- Cut into 6 pieces.
- Roll each piece of dough thinly on a floured board; apply oil to dough surface; sprinkle lightly with a pinch of flour.
- Fold in half, then quarter, roll up into a ball. Let stand for 10 minutes.
- Roll out each piece thinly again, place on a hot griddle.
- Brush each side of dough with oil to prevent sticking, turn frequently.
- Remove roti and clap with both hands until pliable.
- Fold and place on waxed paper. Serve with Curry.

Curry Ingredients:

- 2 cups of in seasonal vegetable diced/cutted
- 2 tablespoons vegetable oil
- 1 large onion, chopped
- 3 garlic cloves, minced
- 2 tablespoons curry powder
- 1 teaspoon chili powder
- 1 teaspoon paprika
- 2 cups water
- Salt and pepper to taste

Curry Procedures:

- Dice vegetables
- Sauté onions and garlic until tender in hot oil
- Add curry powder.
- Add vegetables, salt, pepper, chili powder and paprika
- Fry on medium heat for 10-15 minutes.
- Add 2 cups of water, bring to a boil, then simmer, covered, for about 20 minutes or when the vegetables are fully cooked. Serve with Roti.

F. Thai Sauce

Ingredients:

- 1/2 cup water
- 1/2 cup sugar
- 1/4 cup vinegar
- 1 tblspn cornstarch(whisk in)
- 1 tblspn ketchup
- 1/4 tspn crushed red peppers

Procedures:

- In sauce pan add sugar, cornstarch and water, bring water to a boil
- Add vinegar, ketchup , cornstarch and crushed red pepper
- Let cool and serve