UBC Social Ecological Economic Development Studies (SEEDS) Student Report

Developing a Sustainable Food Outlet for UBC Food Services in the New Beaty Biodiversity Centre

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Scenario 6: Developing a Sustainable Food Outlet for UBC Food Services in the New Beaty Biodiversity Centre

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ABSTRACT

The Beaty Biodiversity Centre, currently under construction on UBC's Main Mall, will be the future site of both the Biodiversity Centre and the Beaty Biodiversity Museum. A new sustainable UBC Food Service outlet is also slated for development within the museum. Expected to be the first of its kind as well as a possible model for other food outlets on the UBC campus, we were tasked with the opportunity to propose 'green' options for the outlet in terms of interior design, energy usage, waste management and menu options, amongst other things. We also showcase the future food outlet's role in the broader scope of the national and global food system. Extensive primary and secondary researched methods were employed, including literature reviews, personal communications with various stakeholders and review of other sustainable food outlets, in order for us to reach our conclusions. Recommendations to the various stakeholders and future AGSC 450 classes were also given.

INTRODUCTION

The new Beaty Biodiversity Centre (BBC) at the University of British Columbia (UBC) will bring together world-class biodiversity research and outstanding natural history collections into an innovative building complex that will consist of a Biodiversity Research Centre and a Biodiversity Museum. The research centre is slated to contain research laboratories and specialized processing and research facilities which will bring together scientists to support research into habitat, species and ecosystems in which we live and will also include an important public education and exhibit function. It will house research laboratories, as well as facilities for specialized processing and research involving a unique world class research collection of plants, fish, insects, vertebrates, fungi and fossils (UBC Properties Trust). In addition, the Centre will have a Biodiversity Museum which will serve as site for public education and ideally foster innovation and change (Richer et al., 2008).

The 123,000 square foot venture and will be located on UBC’s Main Mall adjacent to the Aquatic Ecosystems Research Laboratory (AERL) Building and will also house a new UBC Food Services (UBCFS) outlet on the mail level within the Museum Atrium. This new food outlet is envisioned to be a “green” operation, i.e. one that is characterized by the principles of

social, ecological and economic sustainability. Here is where our task lies for the 2008 UBC Food Security Project (UBCFSP), of "developing a sustainable food outlet for UBC Food Services in the New Beaty Biodiversity Building" (Richer et al., 2008).

Preliminary ideas such as a menu composed of sustainable food choices, including a healthy menu composed of items prepared from whole local foods, energy efficient lighting, sustainable building materials and design, biodegradable takeout ware, and composting of pre and post consumer waste were posed to us and shaped the direction of our research. Our research was also guided by the challenge of a limited space most specifically in the areas of storage and food preparation which limit the outlet's ability to "act as a free standing independent outlet" (Richer et al., 2008).

Our group relished at the prospect of the outlet serving as an opportunity to trial sustainable menu development, building design, energy use, and waste management practices with the campus market. As well as hopefully culminating in it serve as a model restaurant that demonstrates sustainable water, energy, building, design, food and waste practices (Richer et al., 2008). We hope our ideas if used in the future development of this food outlet will fuel momentum for other campus outlets to incorporate similar sustainable principles into their practices.

One could look at our proposal as only a small 'blip' in the grand scheme of a more sustainable global food system. However, we as a group prefer to look at it as another step in this grand scheme. We look at it as having built upon the foundations that have been laid by the Vancouver restaurants with sustainable menus to the Vancouver public institutions and university campuses that have adopted sustainable practices. These steps taken we feel will

culminate in a domino effect which will continue on provincially, federally and eventually globally and we are excited.

A. Vision Statement Group Reflections

As a group, we were able to approach this project from a multitude of angles, from the nutritional stand point to the economic viability of our suggestions. This was directly due to the diversity of disciplines of our group members – Dietetics, Food and Nutritional Sciences, Food and Resource Economics, Animal Science and Sustainable Agriculture. Despite our varied academic interests, we all fully agreed with the UBCFSP's vision statement's overarching emphasis on the importance of food and sustainably (ecologically, economically and socially) re-localizing the food system. Education being the medium of choice to promote awareness of this emphasis also resonated with us, being academics ourselves. Through our joint studies in the Faculty of Land and Food Systems (LFS), we have come across ideas such as those brought up in the 100-mile diet about 'eating local.' This seemed to resonate with us and was a guiding factor in our ideas and suggestions. We also believe that being local is a more practical, realistic and sustainable approach than being purely organic. This stemmed us to make locality also played a large role in other aspects of this project such as when considering building materials, lighting, etc.

METHODOLOGY

For the 2008 UBCFSP, Scenario 6 groups were charged with the responsibility of developing a business proposal for UBCFS regarding a sustainable food outlet for the new BBC. In order to complete this task, extensive research and preparation was required in several different areas. Specifically, these areas included developing a menu plan with recipes and corresponding nutritional analyses, gathering community input from stakeholders and our target

market regarding visions for the outlet and support for potential food items, developing promotional and educational tools to showcase these items, identifying an appropriate waste management plan and sourcing sustainable serving-ware, efficient lighting, green building materials and space-saving equipment. To ensure that the research performed in these various areas was completed thoroughly and efficiently, several different methods were utilized. In particular, research methods such as personal communication, inter-group collaboration, delegation of tasks based on areas of expertise and consultation of various secondary information resources.

The development of a menu plan with recipes and corresponding nutritional analyses represented one of the biggest challenges in the completion of our business proposal. The underlying goal in this area was to incorporate as much locally produced food into the outlet's menu plan as possible, while taking into consideration seasonal availability. The development of the menu plan and the corresponding recipes was largely governed by our limitations in food procurement. In order to outline our limitations, email communication was made with the UBC Farm and UBCFS to attain a full product supply listing, which also included details on seasonal availability and pricing. The corresponding nutritional analyses were completed through the use of *Diet Analysis Plus*, a computer software program designed primarily for dietary analysis.

One of the factors that would determine the potential success of our menu plan was our ability to determine whether there would be interest and support for our proposed food items from our target market. In order to gauge market interest, it was necessary to identify whether or not our target market was interested in seeing more locally produced food items incorporated into on campus food outlets, and whether they would be willing to pay more to purchase these items. Instead of initially designing and implementing new surveys to determine these answers,

our group chose to first consult and examine the findings of previous UBCFSPs. We were able to find relevant survey results from Scenario 2 and 3 reports from 2006, and Scenario 4, 5 and 6 reports from 2007.

Gathering community input from stakeholders involving the vision for the new food outlet presented the opportunity to engage in inter-group collaboration. With input being required from our four main stakeholders by the four groups participating in Scenario 6, the common goal amongst the groups was to maximize the information gathered, while minimizing overlap and the time required of each interviewee. In order to achieve this, each group was assigned to a different stakeholder with whom they would conduct an interview. The AGSC 450 WebCT online discussion board was used as a forum by all Scenario 6 groups to compile questions for each stakeholder and to later post their stakeholder interview results.

The development of promotional and educational tools provided the opportunity for our group to showcase our own creative ideas and personal experience alongside those from other sustainable food outlets. Our main goal in this process was not only to inform our target market of the environmental and personal health benefits of eating more locally, but also to encourage a stronger connection between producers and consumers. In order to develop such tools, ideas were brainstormed collaboratively as a group and primary and secondary research was collected on successful 'green' food outlets. Suggestions from our stakeholders were also considered.

The identification of an appropriate waste management plan was perhaps the simplest area to research as UBCFS already had existing waste management policies and guidelines that applied to all of their food outlets. Our goal was to ensure that the waste management plan for our proposed outlet would run adjacent to these as well as help to fill any gaps in UBCFS existing policies and guidelines.

Sourcing sustainable serving-ware, efficient lighting, green building materials and space saving equipment was a final area of research that was essential in developing our proposal. Our goal when sourcing these inputs was to find suppliers that not only shared a similar vision with regard to environmental sustainability, but also were as local as possible to minimize transportation distances. Secondary internet-based research and personal communications via email were primarily used.

RESULTS AND DISCUSSION

A. Other Sustainable Food Outlets

At UBC, there are numerous food outlets which support sustainable food service. Besides encouraging customers to eat local foods, teaching them to sort their waste is also an important step towards sustainability. After finishing a meal in a UBC food outlet, except for the plastic folk and spoons, all other waste such as food waste, paper single-use plates and cup, napkins, as well as tea bags, are compostable and plastic bottles and cans can be recycled. Sorting our waste is an environmentally friendly action because there are many advantages which include increasing the effectiveness of waste management, reducing the need to purchase fertilizers and top soil and reducing the amount of waste being sent to landfills (UBC Recycle, 2008). For example, The Barn and Café Perugia encourage their customers to sort their waste by providing a sorting station with clearly labeled compost, recycling, and garbage bins. There are also signs on the sorting station listing what can go in each respective bin. Moreover, small stand-up versions of these signs can also be found on each table. Posters on UBC in-vessel composting can also be found in these outlets. They describe how the compostable materials will be returned to the soil and used on the UBC Farm. These practices are ones that we would suggest be replicated in the new BBC food outlet.

There are other food outlets in UBC that offer local foods. For example, Aphrodite's Cafe obtains their food supply from Glen Valley Co-op, which is located in Abbotsbord, BC (Y. Lim, Personal Communication, March 28th, 2008). Raincity Grill is another local foods supporter. They purchase their celeriac, carrots and squash from North Arm Farm which is located in Pemberton, BC. Their pork also comes from another BC source, Sloping Hill Farm in Qualicum Beach, BC (Raincity Grill 2006). UBCFS's new food outlet at the BBC is not envisioned to be as up-scale as a fine-dining establishment such as Raincity Grill, however, we can take Raincity Grill and Aphrodite's Cafe as models in keeping with our local food philosophy.

B. Suppliers and Seasonal Availability

Currently, UBCFS has contracts with Allied Foods, Neptune Foods, Coca Cola, and Happy Planet. Local food procurement includes eggs and poultry from Golden Valley Foods and Vanderpol's Eggs through Neptune Foods. In addition, Allied Foods provides some produce grown locally (see Appendix 1). The benefit of obtaining food from large suppliers such as Allied is that almost everything comes in already prepared (e.g. washed, peeled, diced). UBCFS does obtain some produce from the UBC Farm, however, because of changes in seasonal availability and the UBC Farm's relatively small production scale, they are considered less reliable and consistent for a large-scale outlet like the campus residence cafeterias. Furthermore, UBCFS is currently working on acquiring local apples year-round through Discovery Organics. (D. Yip, personal communication, March 5, 2008).

Through research conducted regarding other possible suppliers providing local food, we have identified some ideas for future suppliers and some challenges. Proposed future suppliers are as follows:

- Terra Breads

    - All of their breads are made from organically grown Canadian grain, which is milled in the Lower Mainland. This would be an easy supplier to incorporate into the food offered at the new food outlet because they already deliver to Sage Bistro on campus. (Terra Breads, 2008)
- Anita's Organic Mill
    - The multigrain waffle mix is made from Canadian grain milled in Chilliwack, BC and would provide variety to the breakfast items offered. (Anita's Organic Mill, 2008)
- Naturally Homegrown Foods
    - Hardbite Potato Chips come in a variety of flavours and are made in Maple Ridge, BC using local potatoes and oil with a healthier fat profile. Furthermore, these chips can be obtained through Neptune Foods, which as mentioned, is already a major supplier to UBCFS. (Naturally Homegrown Foods, 2008)
- Duso's Pasta and Cheese
    - The pasta manufactured in Burnaby, BC, is made using Canadian grain. Duso's pastas are also available through Neptune Foods, and have a large food services market. (Duso's Enterprises, 2001)

Some of the challenges we encountered included:

- Large national companies, such as Canada Bread Co., may be more reliable and consistent in terms of quality and quantity, however, they were unable to definitively state where their grain is grown and processed. (Canada Bread Co., personal communication, April 1st, 2008)

- Variety of local food is limited by the fact that UBC FS didn't want to work with individual farms, but rather larger suppliers. (A. Parr, personal communication, February 11th, 2008)

In conclusion, our group found that demand for local food procurement has to come from the customers and food outlets so that suppliers will source more local products to meet the increasing demand. Furthermore, suppliers should be encouraged to highlight their products that are local so as to encourage their clients to adopt more sustainable practices.

C. Menu Suggestions, Recipes and Nutrition

To develop seasonal menu items, we consulted the availability from the UBC Farm, the local produce available through Allied Foods and the potential produce available from other BC suppliers using the seasonality reports on the Eat BC website (see Appendix 1). Using primarily these local foods and keeping in mind the limitations posed with space (see Appendix 12) and equipment (see Appendix 13), we created two sample meals per season (see Appendix 2). The objective of these sample menus was to show the variety of food this food outlet is capable of creating as well as showing how to use the equipment and local ingredients in a creative and simple way. According to Andrew Parr, Director of UBCFS, the new food outlet will be open from 7:30am-5:00pm daily, thus, we felt breakfast and lunch entrees would satisfy the food needs of the future customers (personal communication, February 11th, 2008). Furthermore, we wanted to ensure the meals were healthy and acceptable to a large population. Included on each recipe is at least one nutrition claim, which was created using information obtained from the nutrient analysis of the proposed menu items using *Diet Analysis Plus*. The sample menu items are:

- Fall

Breakfast: Very Berry Waffle

-uses fresh local berries and a locally made organic waffle mix

-great source of fibre and whole grains

Lunch: Biodiversity Salad

-uses a variety of fresh BC vegetables in season to create a healthy lunch

-2 ½ servings of fresh BC vegetables in one meal

- Winter

Breakfast: Seasonal Scramble

-using local eggs and cheese, and seasonal vegetables and herbs

-a great protein-rich way to start the day

Lunch: Beaty Mac & Cheese

-using local pasta, milk, and cheese

-a comforting source of Calcium and Vitamin D in the cold of winter

- Spring

Breakfast: BC Toast (Apple Cinnamon French Toast)

-using local apples and eggs

-an energy-rich breakfast including all four food groups

Lunch: Little Italy Panini

-using locally raised chicken, seasonal spinach and peppers

-a well-rounded meal on those brisk spring days

- Summer

Breakfast: BC Berry Parfait

-using local yogurt, granola, and seasonal fresh berries

-less than 5g of fat, and fewer than 300 Calories

Lunch: Grilled Chicken Sandwich

-using locally raised chicken, and fresh basil, tomato, and lettuce

-great source of protein, and low in fat

D. Community Input

i) Stakeholders

Andrew Parr summarized the collective vision for the new UBCFS food outlet by stating that he wanted "a sustainable food outlet, providing healthy, nutritious and tasty menu items using local ingredients" (personal communication, February 11th, 2008). In terms of the menu, Parr suggested a deli style food outlet with fresh salads and sandwiches 'to-go.' It is important to consider market demand, variety, cost, space, equipment and food trends when developing a menu. Other considerations raised by the stakeholders in terms of the menu plan and food suppliers included that:

- Food should be purchased already prepped (washed, peeled, diced, etc.)
- There must me a menu mix of high and low cost items
- Most food items should be local, if unable to purchase local, then it should be organic (e.g. coffee)
- Food should be purchased through a large supplier or a co-operative, not through individual farms, as reliability and consistency are critical

All of these factors must be considered within the framework of the new food outlet as it is in the niche market of promoting sustainability. Furthermore, the constraints of seasonality and very limited space (see Appendix 12) dictate many of the decisions to be made. (A. Parr & D. Yip, personal communication, February 11th, 2008).

For the marketing of the outlet and its food, Juliana Campbell, UBCFS Marketing Coordinator, felt that location, visible signage, quality selections and price predicted success. Parr wanted to have the nutritional value of the menu items advertised, and thought that a visual representation of the outlet's food miles or ecological footprint would be effective. While Parr has found that customer education and participation are barriers to proper waste management, clear signage, convenient locations for receptacles and 'I'm compostable' stickers are ways that Campbell has worked to overcome them. (J. Campbell, personal communication, February 17th, 2008).

In regards to the materials used for the interior design, as well as, the take-out containers, UBCFS wanted to be as sustainable as possible, however there are increased costs associated with sustainability in the current industry (A. Parr, personal communication, February 11th, 2008). The food containers must be compostable and compatible with UBC's waste management system. Dorothy Yip, General Manager of Retail Operation, Purchasing and Project Coordination at UBCFS, wanted us to explore options for coffee cup lids, soup bowls, cutlery and containers for hot food items (D. Yip, personal communication, February 11th, 2008). Parr wanted to see the interior materials such as flooring and countertops made of natural or recycled materials.

Though the collective vision of the stakeholders is that of a sustainable food outlet that uses local ingredients, they also recognize that with the current industry it is virtually impossible to be entirely sustainable and local (A. Parr, personal communication, February 11th, 2008). UBCFS has made significant progress in becoming more sustainable over the past years. UBCFS has handled waste management by introducing receptacles into all their outlets across campus in order to facilitate and promote composting and recycling. Furthermore, food outlets are currently

using compostable food and beverage containers including corn, bamboo and molded paper. Green taxes and eco-cards are ways UBCFS has encouraged customers to bring their own containers. In addition, there is a pilot project at Totem residences in progress where environmentally-friendly cleaning supplies from Ecolab are being used. Once data has been collected and assessed, UBCFS is hoping to implement these cleaning supplies in all of their facilities. In terms of food procurement, all of the eggs and poultry used in the foodservice establishments are locally raised and purchased through Neptune Foods. As well, coffee sold across campus is shade-grown, fair-trade (A. Parr & D. Yip, personal communication, February 11, 2008).

ii) Findings from previous community surveys

The key component to the success of the BBC food outlet is consumer interest. To assess this, we reviewed relevant reports from previous AGSC 450 groups and found that the answers we required to determine community support were already collected and were in agreeance with our project. In 2007, Group 10 found that most people surveyed around campus would purchase local food if it was readily available and competitively priced. Furthermore, survey participants were willing to pay $0.25-0.75 more for food items in support of the UBC Farm, and were in 100% support of incorporation of UBC Farm products into AMS food outlets (Group 10, 2007). Despite the fact that we are not just focusing only the UBC Farm, but other local providers and UBCFS as well, we have no reason to believe that support would diminish. In 2006, Group 18 found that many survey respondents preferred local and/or organic foods, and Group 9 found that the majority of individuals would like to see more local, organic and fair-trade products available on the UBC campus. It is evidenced community support such as this that encouraged the development of the local, organic menu sample for each season (Group 18, 2007;

Group 9, 2007). Group 3 of the 2007 AGSC 450 class also discussed that a premium price could be applied as a result of the convenient location, high-quality ingredients, and the lack of a similar competition outlet (Group 3, 2007). This further supports the vision of the BBC food outlet as a niche food outlet that supports sustainable and local practices.

E. Promotional and Educational Tools

With the proposed food outlet offering a unique vision and experience unlike most others on campus, the use of effective promotional and educational tools to increase awareness will undoubtedly play a vital role in the outlet's success. However, before any promotional or educational strategies are outlined, it is necessary to first identify the specific market that will be targeted. Because the new outlet will be located in the new BBC, the target market will be the general university population consisting of various age, income, lifestyle and socio-cultural groups situated within the geographical boundaries of the university campus. This market includes, but is not limited to, students, staff, faculty and workers.

In order to develop promotional and educational tools that will have a high likelihood of success, UBCFS Marketing Coordinator, Juliana Campbell's suggestions were taken as a guide. Ideas were also brainstormed collaboratively as a group with many of the final recommended tools being based on first hand research and observations collected from other popular food outlets with previous success in these areas.

i) <u>Promotional Tools</u>

With no formal marketing plan currently existing for the future outlet, it has been suggested that most of the promotion be accomplished through print advertisement, word of mouth and various on campus events (J. Campbell, Personal Communication, Feb. 17, 2008).

With this suggestion in mind, it is recommended that a strong promotional effort be accomplished through:

- Flyers/Posters in approved locations around campus
- Advertisements in University newspapers, newsletters, publications, etc.
- Coupons (Thunderbird package, Ubyssey, etc.)
- University websites
- Information/sample booths at the SUB during special events
- Word of mouth
- LFS and other faculty MUG tours

Traditional tools such as those listed above not only have the advantage of reaching the majority of our target market, but are also ultimately cost efficient and easy to implement. In addition to the suggestions provided by Campbell, other promotional tools inspired by first hand research into other successful outlet are also recommended. These more innovative tools include:

- Offering branded re-usable containers that easily spread awareness
- Offering discounts to customers who bring re-useable containers
- Offering Loyalty Cards (coffee-specific)

Innovative promotional tools such as those listed above are likely to prove more costly, however they help to establish strong brand recognition and consumer loyalty. As it has been suggested, the establishment of a well-recognized and preferred brand is one of the strongest indicators of success (J. Campbell, Personal Communication, Feb. 17, 2008).

ii) <u>Educational Tools</u>

With underlying goals that are strongly geared towards environmental sustainability and the re-localization of the UBC food system, seizing opportunities to increase awareness on the

proposed outlet's vision will undoubtedly play a vital role in its success. As outlined by Campbell, increasing consumer knowledge through education is often a key factor in driving a successful marketing campaign (J. Campbell, Personal Communication, Feb. 17, 2008). Since it is suggested that educating consumers on the outlet's underlying vision will help to promote increased interest and adoption, it is recommended that some of the following educational tools be utilized:

- Labeling coffee cups with eco tips/facts
- Displaying large posters with local farmer & supplier profiles
- Using LCD menu screens to highlight quick eco facts and tips
- Information/sample booths at the SUB during special events

Also, as the time spent by consumers within the food outlet will most likely be limited, the educational tools recommended are designed to be quick, effective and ultimately informative. Eco tip/fact printed coffee cups are modeled after Starbucks' 'The Way I See It' campaign and are designed to educate and accommodate to the fast-paced nature of our 'on-the-go' customers, while more stationary tools such as farmer profile posters are designed to encourage a greater connection between producers and consumers.

F. Waste Management

A good waste management plan is a crucial part of a sustainable food system. The UBC Waste Management (UBCWM) plan consists of both recycling and composting programs readily available to the UBC community. Created in 1991, this program was a result of public concern over the effects of solid waste on the environment, and not only thrives for a sustainable environment, but for social sustainability through promotion as well (UBC Department of Plant

Operations [UBCDPO], 2004). We believe that collaboration with UBCWM will further strengthen the sustainable aspects of the BBC food outlet.

One of the services available through UBCWM is solid waste collection, consisting of campus garbage pickup, campus recycling pickup, confidential shredding, electronics and fluorescent light recycling and grounds litter pickup (UBCDPO, 2004). It is impossible to avoid the generation of solid waste within any system, as sustainable as it may be. However, we believe that these services will ensure proper management of garbage and recyclables. UBC Waste Management also consists of the Compost Project coordinated by UBC students employed part-time throughout the academic year and full time during the summer. This project was initiated as a result of concerns over the amount of organic matter entering the landfill. The UBC In-Vessel Composting Facility was later created to manage food waste from food campus outlets and residences (UBCDPO, 2004). This facility creates a closed loop system through which the UBC community is able to reuse their own composted organic waste on the campus landscape. This program is an excellent way to manage the outlet's organic and inorganic waste as it is situated within the campus and hence requires little to no transportation between sources (UBCDPO, 2004).

UBC Waste Management collects both pre-consumer and post-consumer organic waste as part of its program. Food wastes which consist of raw fruits and vegetables as kitchen scraps are considered as pre-consumer waste, while post-consumer waste consists of cooked food scraps (UBCDPO, 2004). These organic wastes will be composted through the UBC Waste Management's Compost Project. The serving-ware distributed by the BBC outlet will be 100% compostable/biodegradable. These include soup bowls, sandwich and burger containers, plates, cold and hot cups, sleeves, straws, cutlery and plastic bags, and can be integrated into the

compost project as well as the food waste. This will be discussed in further detail in the next section of the paper. Green bins will also be available both inside and outside the outlet to promote composting among students. These bins will be accompanied by grey and blue bins as well, representing the recycling of paper and carton products by the blue bins, and bottles, juice boxes and cans by the grey bins (UBCDPO, 2004).

UBC Waste Management is involved in numerous educational programs and initiatives, and has created a network with other organizations on campus to educate the community on waste reduction. The association also offers composting, recycling, and litter reduction workshops which students can take advantage of. These promotional events can be advertised through our restaurant and can create a reciprocal affiliation where both the outlet and the waste management program benefit from each other. Through collaboration, it is also possible to advertise the restaurant as a sustainable food system through *The Rind* (UBCDPO, 2004). As a department newsletter, *The Rind* includes topics such as sustainable living practices, composting, recycling and litter reduction. By creating a strong relationship between the BBC outlet and UBC Waste Management, we will also be encouraging a sustainable society (UBCDPO, 2004).

G. Serving Ware

Serving-ware is also an important determinant of sustainability within a food system, and could be a positive contributor to social, environmental and economic sustainability. To maintain a closed loop for our waste management plan, we have decided to reduce our solid waste as much as possible, while increasing the amount of potential composting. In effect, BSI Biodegradable Solutions (BSI) appears to be the perfect local distributor for our business as it supplies the North American market with biodegradable food service ware, food packaging and flatware products (BSI Biodegradable Solutions [BSIBS], 2008). Located in Vancouver, BC,

BSI enables the BBC food outlet to promote sustainability and create a healthier environment by specializing in products manufactured from renewable resources (BSIBS, 2008).

We have organized the essential information acquired from BSI Biodegradable Solutions Pricing Guide (2007) including costs, number of units per case, and product codes into tables to create a smooth ordering process. The cold cups available through BSI, are made from corn derived Polylactic Acid (PLA), labeling them as 100% compostable corn cups. The hot cups, produced specifically for hot beverages, consist of an inner lining with a petroleum-based plastic (polyethylene) to prevent leaking and the cup itself is lined with a bioplastic made from corn (BSIBS, 2007). These are the only paper hot cups made from fully renewable materials. The prices and order numbers of both hot and cold cup and their lids can be viewed in Appendix 3. The straws, cutlery and salad bowls available through BSI and shown in Appendix 4, are also made from PLA derived from corn which is currently one of the most popular compostable alternatives to plastic. As listed in Appendix 5, the soup bowls, sandwich/burger containers and plates are sugarcane fibre cups, not only making them 100% biodegradable and compostable, but recyclable in the conventional paper stream as well. Appendix 6 compares regular Styrofoam cups with sugarcane fibre cups available through BSI, and the benefits of the latter are clearly evident (BSIBS, 2008). We have also decided to use cellulose bags, shown in Appendix 7, as means of packaging 'to-go' orders. These bags clear products made from plant material acquired from non-rainforest tree farms. They are 100% biodegradable and degrade within 10 to 30 days when buried. The sleeves accompanying the hot cups are 100% recycled and have the option of custom art design with vegetable based ink. Furthermore, they cost $75.00 per 1,000 sleeves. Unfortunately, BSI does not offer biodegradable lids as biodegradable lids are still in development (BSIBS, 2008).

Integrating BSI into our business will not only help contribute to our environmental sustainability initiative, but it will also help create an even more local network. This relationship defines sustainability in more ways than one as it also decreases transportation between sources, and in effect we will be supporting a local business. It was rather difficult to find a local distributor which supplied 100% biodegradable serving-ware, however, once contacted they were extremely helpful, friendly and eager to offer more information about their products.

H. Lighting and Interior Material

i) Lighting

With lighting representing one of the primary sources of the outlet's energy consumption, the potential to incorporate energy efficient lighting products presents the opportunity to substantially increase environmental sustainability through energy conservation. In order to source a list of energy efficient lighting products that would be best suited for the proposed food outlet, an appropriate and well-recognized product standard had to be identified. Natural Resources Canada's (NRCan) Office of Energy Efficiency's (OEE) endorsement of ENERGY STAR (ES)-qualified products provided this standard. Internationally, ES is a symbol of energy efficiency, while in Canada it is a dynamic government-industry partnership aimed at phasing out inefficient lighting (OEE, 2007). In addition to direct cost savings, using energy efficient lighting products also has notable environmental benefits, such as decreased greenhouse gas emissions in regions where fossil fuels are commonly burned to produce electricity (The Office of Energy Efficiency [OEE], 2007).

In addition to using ES-qualified lighting products to reduce energy usage, another primary goal when selecting appropriate lighting was to source a certified supplier that was local. Through the NRCan OEE website, CNA Lighting, a certified supplier of ES-qualified products

based out of Burnaby, BC, was selected. CNA Lighting is a division of CAN International Enterprises Inc., a privately held Canadian company founded in 1988, dedicated to providing high quality lighting equipment (CAN Lighting, 2008). The fact that CNA Lighting is locally based ensures that the newly proposed food outlet is designed, constructed and maintained with sustainability in mind. Having a local lighting supplier reduces the transportation distance and amount of fossil fuels used to ship and receive products, while also supporting another local business helping to contribute to environmental, social and economic sustainability.

In order to attain the necessary information regarding product line pricing, we contacted Al Yuet, CNA Lighting's Sales Coordinator, via email. Three ES-qualified product lines are recommended for the new food outlet. These include compact fluorescent lamp (CFL) basic spiral and tubes, T5 fluorescent light strip fixtures (FLSFs), and light emitting diode puck lights.

The use of ES-qualified CFLs is recommended, as they are designed to be compatible with the majority of standard lighting fixtures. In addition to convenience, CFLs are proven to use up to 75% less energy than conventional incandescent bulbs, which are traditionally very wasteful (OEE, 2007). Although they are commonly more expensive, they provide excellent lighting for a fraction of the energy usage and are proven to last for at least five years and up to ten times longer than standard incandescent bulbs (OEE, 2007). Less frequent replacement in combination with lower energy usage is likely to more than offset the higher initial cost of procurement. Pricing ranges from $2.99 - $6.99 before taxes per bulb (A. Yuet, Personal Communication, March 2nd, 2008). A numerical comparison of energy use and light output between standard incandescent bulbs and ES-qualified CFLs can be found in Appendix 8, while CNA Lighting's full CFL product listing can be found in Appendix 9.

Similarly to CFLs, T5 FLSFs are also recommended because of their energy efficiency and long operating lifetime. Although T5 FLSFs are a viable option and are commonly used in business and commercial settings, they are often criticized for not being aesthetically attractive. Although the price of procurement is higher than other traditional incandescent bulbs, less frequent replacement rates and lower energy usage is likely to more than offset the higher initial cost. Pricing ranges from $19.99 - $39.99 before taxes per strip (A. Yuet, Personal Communication, March 2, 2008). CNA Lighting's full T5 FLSF product listing can be found in Appendix 10.

Unlike the fluorescent options recommended previously, LEDs is a technology that is relatively new and currently evolving (OEE, 2007). In many cases LEDs have been proven to reduce energy consumption and costs by up to 90% when compared to an incandescent bulb (OEE, 2007). LEDs are commonly used as decorative lighting to improve aesthetics, as they are functional, attractive and cost-competitive (CNAL n.d.). Additionally, LED technology is currently the only technology that meets the ES specification for decorative lighting (OEE, 2007). Although they are relatively expensive, even when compared to CFLs and T5 FLSFs, they are extremely energy efficient and their attractive qualities are likely to fit the "modern" vision for the proposed outlet. 30-puck LED sets retail for $139.99 before taxes (Yuet, personal communication, March 2, 2008). CNA Lighting's full LED Puck Lights product listing can be found in Appendix 12.

ii) Interior Materials

Sustainable building, as a concept, incorporates and integrates a variety of strategies during the design, the construction and operation of building projects. One important strategy in the design of a building is the use of green building materials and products (Government of

California, 2007). Green building materials are composed of renewable, rather than nonrenewable resources and are environmentally responsible because impacts are considered over the life of the product (Spiegel and Meadows, 1999). The benefits provided by green building materials to both the building owner and occupants include: reduced maintenance/replacement costs over the life of the product, energy conservation, improved occupant health and productivity, lower costs associated with changing space configurations and greater design flexibility (Government of California, 2007).

Building and construction activities worldwide consume three billion tons of raw materials each year or 40% of total global use (Roodman and Lenssen, 1995). The use of green building materials and products promotes the conservation of our ever depleting non-renewable resources. The integration of green building materials into building projects can help reduce the environmental impacts associated with the extraction, transport, processing, fabrication, installation, reuse, recycling, and disposal of these building industry source materials (Government of California, 2007).

Selection criteria for green building materials and products can include (and is in no way limited to): resource efficiency, indoor air quality, energy efficiency, water conservation and affordability. More specific information on this can be found at The California Integrated Waste Management Board's Green Building page – http://www.ciwmb.ca.gov/GreenBuilding/. The majority of available information on green building materials for furnishings came primarily from companies mainly geared towards home and condominiums and not necessarily commercial ventures. Due to the size of the new food outlet, we felt that these companies were applicable to the task at hand. As well, in an effort to keep with our trend of localization, we kept

our suggestions for building material suppliers to those from Vancouver and not further than the West Coast of Canada.

The Healthiest Home and Building Supplies (HHBS) touts themselves as "Canada's premier green building store" (The Healthiest Home and Building Supplier [HHBS], 2005). They are based out of Calgary, AB and deal in flooring, bathroom, countertops, cabinets, tiles and paints and finishes (HHBS, 2005). Green Works Building Supply (Green Works, 2008) was founded by two local Vancouverites and is based out of the city. They are a self-proclaimed "one-stop shop" for environmentally friendly building materials and deals in numerous building supplies including flooring, bathroom, countertops, tiles and paints and finishes (Green Works, 2008). Due to time constraints and unclear instruction on what surfaces to research, we decided to focus our building material suggestions on three areas: flooring, countertops and cabinets. Our suggested choices were determined by sustainability, versatility of use, durability and price.

Our most preferably choices for flooring were bamboo, recycled wood and cork. Bamboo is the fastest growing land-based plant on earth and can be harvested every four to five years or selectively every year. If harvested appropriately, replanting of bamboo stock is unnecessary as it grows back from the roots making bamboo a renewable resource (HHBS, 2005 and Maas, 2006). Bamboo is also extremely durable; it is harder than red oak or maple (Maas, 2006). As well, it has a wide variety of recommended uses thus making it applicable to the kitchen, serving area and main dining area. We also recommend that the brand of bamboo flooring be ECO-logo (Canadian government's Environmental Choice Program) certified and contain no formaldehyde-laden, off-gassing resins. It should also be low in volatile organic compounds (VOC) and formaldehyde content (HHBS, 2005 and Maas, 2006). Pricing will depend on style and measurements, but most bamboo flooring from the suppliers we researched ranged from $4.00-

$7.00 per square foot. The HHBS also offered competitive project pricing for projects over 1,000 square feet (HHBS, 2005).

We recommend wood flooring that is from either salvaged or reclaimed wood and is Forest Stewardship Council-certified (also inquire about a chain-of-custody certification). As well, avoid laminated products with added formaldehyde (Maas, 2006). The Healthiest Home supplies Teka Engineered Wood which is Eco-logo certified and environmentally friendly, engineered wood. The "core is 'orchard salvage,' wood derived from rubber trees that would normally be burned at the end of their rubber-producing lifespan" (HHBS, 2005). They also supply reclaimed wood flooring of both river wood, harvested from the bottom of the Ottawa River, and wood from old buildings. Pricing researched ranged from $3.00-$8.50 for salvaged wood and $7.22-$11.26 for reclaimed wood (depending on measurements and grade) (HHBS, 2005).

Cork is a renewable resource made from the bark of the cork oak (Maas, 2006). Cork can be sustainably harvested every nine years by a process that does not damage the tree (HHBS, 2005). We recommend products that have no formaldehyde added as well as avoiding cork-vinyl composites (Maas, 2006). Cork flooring is easy to clean and water resistant (if properly sealed). Pricing varies from $3.05-$4.75 per square foot depending on finish and format.

Our top choices for countertop and cabinet materials were stainless steel, paper composite and reclaimed or salvaged wood. These were chosen based on the factors of sustainability, durability, ease to clean and price. Stainless steel is a highly durable, easy to clean material with high salvaged or recycled metal content. The only drawback is that it scratches easily. Pricing ranges from US$45-US$65 per square foot (we were not able to obtain a Canadian price) (HHBS, 2005)

Paper Composite is a solid surface that is made from paper and a resin binder. It is easy to clean, durable (particularly impact and heat resistant) and because it can be manufactured using recycled paper, it is a renewable resource. The drawbacks to paper composite include that it can be scratched, lighter colors may show stains and colors may not be UV stable (Subject Editors, 2006). PaperStone is a popular paper composite brand made from recycled paper. It is the only architectural surface on the market today that is certified by the Forest Stewardship Council (FSC), Smartwood and the Rainforest Alliance. Most Paper Stone products are made from post-consumer waste, recycled paper and proprietary, petroleum-free, phenolic resins. Water is used as the resin solvent as much as possible (Paper Stone). Pricing varies depending on thickness, size of surface, raw or manufactured material and starts from $48-$80 per square foot (Subject Editors, 2006). Specifications for reclaimed and salvaged wood are similar to those aforementioned in the flooring section. Price for countertops and cabinets are however different and varies from US$50-US$75 (we were unable to obtain a Canadian price) (Subject Editors, 2006).

I. Possibilities of Overcoming Space Limitations

The kitchen of the BBC food outlet measures 1.98 meters by 4.88 meters and therefore, space limitation is a main challenge to the food outlet. The main problems needed to be overcome are: the limitation of space for food storage, the lack of a conventional stove or oven for cooking and the lack of a dishwasher. As a conventional refrigerator cannot fit in the kitchen space, storage of large amounts of perishable foods such as fresh meats and seafood becomes impossible (D. Yip, Personal Communication, March 5, 2008). A small cooler will be the only storage facility in this food outlet (D. Yip, Personal Communication, March 5th, 2008). We thus

recommend the choice of foods such as breads, vegetables and eggs that are more shelf-stable or need minimum storage input.

Large cooking appliances such as an oven or conventional stove will also not be available in this food outlet due to space limitations (D. Yip, Personal Communication, March 5, 2008). Other cooking methods such as grilling and pan-frying will have to be utilized for hot dishes. Several cooking appliances that can be used and added to the kitchen are listed in Appendix 13. These suggested cooking appliances are portable and small in size, but are also suitable for commercial use.

To stem the issue of the dishwashing problem because of the lack of a dishwasher, compostable and single-use food containers will be used. Currently, corn containers and molded paper for coffee cups and jackets are being used in other UBCFS outlets (D. Yip, Personal Communication, March 5, 2008). Bamboo fiber containers have also been used, however, their supply is limited (D. Yip, Personal Communication, March 5, 2008). We will also encourage all customers to adopt the practice of bringing their own reusable containers.

RECOMMENDATIONS

Based on our experiences in the development of a new sustainable food outlet for UBCFS in the new BBC, we have the following recommendations for the stakeholders and future Agsc 450 students.

A. For Stakeholders

We suggest that stakeholders utilize the philosophy of 'Kaizen,' which is a system with its origins in Japan. The word 'kaizen' means 'improvement' in Japanese. This system can be applied to any workplaces in order to create an innovative, continuous and operational efficient

working environment from CEO to workers. A successful example is the Toyota Production System' (TPS) (Value Based Management [VBM], 2008).

There are three fundamental principles to 'kaizen': 1) Eliminate inefficiency and consider process and result. For example, it is better to think before action so that each movement and action could be well utilized, and no waste of energy and time; 2) Systemic, meaning not to focus mainly at individual part works, but to also look at the whole working process as problems may be linked to one and other in the whole picture. Therefore, decisions should be made before process for the entire production system and not just for certain individual parts; 3) Accept changes. Acceptance is a significant principle in 'kaizen' because once people are accustom to their daily work routine, most are not willing to change and do not believe that change is necessary even though suggestions may be beneficial (VBM, 2008).

Moreover, there are five founding elements suggested by the 'kaizen.' They are, in no particular order: teamwork, personal discipline, improved morale, quality circle, suggestions for improvements. Our group suggests that the new BBC food outlet utilize the 'kaizen' philosophy because a long term regulation and continuous improvement is necessary and fundamental for a business to become successful.

B. For Future AGSC 450 Students

Our group recommends that future AGSC 450 students carry out a survey to evaluate the market response for the new BBC food outlet. We suggest that the survey include:

- Customers' feedback on the quality of food and price.
- Is organic and local food an issue that attract customers to this food outlet?
- How they heard about the food outlet?
- Is the location convenient for them?

- The main customer type that the food outlet serves e.g. students, professors or residents.

CONCLUSION

The Beaty Biodiversity Café will be a sustainable food outlet promoting local, nutritious food and environmentally-friendly practices. Through extensive research, we have developed strategies to achieve the vision of this new food outlet, and recommendations for the key stakeholders and future Agsc 450 students. We discussed other sustainable food outlets, current and potential food suppliers, and seasonal availability of foods to be included in the menu. Input from stakeholders and the UBC community both guided and supported our research into creating a sustainable food outlet. 'Green' promotional and educational tools were suggested in association with compostable serving ware, and proper waste management. Finally, lighting, interior materials, and cooking equipment were considered with the space limitations and sustainable vision in mind. The Beaty Café is a revolutionary food outlet on the UBC Campus, and it is our hope that it will pave the way for more sustainable initiatives across the campus and around the globe.

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APPENDIX

Appendix 1. Seasonal Availability Table. (Group 3, 2006; D. Yip, personal communication, April 3rd, 2008; Eat BC, 2008)

	Fall (Sept-Nov)			Winter (Dec-Feb)			Spring (Mar-May)			Summer (Jun-Aug)		
	UBC	Allied	BC	UBC	Allied	BC	UBC	Allied	BC	UBC	Allied	BC
Apples		☑	☑		☑	☑		☑	☑		☑	☑
Apricots												☑
Beans	☑		☑							☑		☑
Beets	☑	☑	☑				☑			☑	☑	☑
Blackberries			☑									☑
Blueberries			☑									☑
Broccoli	☑		☑				☑			☑		☑
Brussel sprouts			☑	☑		☑						
Cabbage	☑	☑	☑		☑	☑	☑			☑	☑	☑
Carrots	☑		☑	☑			☑			☑		☑
Cauliflower	☑		☑							☑		☑
Celeriac										☑		
Celery	☑		☑							☑		☑
Cherries												☑
Corn	☑		☑							☑		☑
Cranberries			☑									
Cucumber	☑	☑	☑		☑	☑		☑	☑	☑	☑	☑
Currants			☑									☑
Eggplant	☑											
Fennel	☑						☑			☑		
Garlic			☑			☑						☑
Herbs	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
-basil												
-chives												
-cilantro												
-dill												
-lemon balm												
-mint												
-parsley												
-rosemary												
-sage												
-savory												
-thyme												
Kale	☑		☑	☑			☑			☑		☑
Kohlrabi	☑									☑		
Leeks			☑									
Melon	☑		☑							☑		☑
Mushrooms		☑	☑		☑	☑		☑	☑		☑	☑
Okra										☑		
Onion	☑		☑							☑		☑
Pac choi	☑		☑				☑			☑		☑
Peaches												☑
Pears			☑			☑			☑			☑
Peas	☑									☑		☑

Peppers	☑	☑	☑					☑	☑	☑	☑	☑
Plums			☑									☑
Potatoes		☑	☑								☑	☑
Pumpkin	☑		☑									
Radish	☑		☑	☑			☑		☑	☑		☑
Raspberries			☑									☑
Rhubarb									☑			☑
Salad Greens	☑	☑	☑	☑			☑	☑	☑	☑	☑	☑
-amaranthus												
-arugula												
-lettuce												
-mizuna												
-mustard												
-spinach												
-swiss chard												
Shallots			☑									☑
Strawberries			☑									☑
Summer squash	☑									☑		☑
Tah tsai	☑		☑	☑			☑			☑		☑
Tomatillos	☑									☑		
Tomatoes	☑		☑			☑			☑	☑		☑
Turnips	☑	☑	☑		☑	☑	☑	☑	☑	☑	☑	☑
Winter squash	☑		☑			☑						

Appendix 2. Seasonal Recipes.

Breakfast:

Very Berry Waffles

Ingredients:

500 ml Anita's Organic Mill multi-grain waffle mix
375 ml 1% milk
60 ml melted butter
3 eggs

500 ml berries (eg. blueberries, raspberries, strawberries, blackberries)

Directions:

In a large bowl, whisk together milk, butter and eggs. Stir in waffle mix until just combined. Let stand 10 minutes. Preheat waffle iron. Pour about 1/3 cup of batter into waffle iron for each waffle.
Garnish cooked waffle with 1/3 cup of mixed berries.

Per six servings.

Nutritional Info:

Great source of fibre and whole grains.

Lunch:

Biodiversity Salad

Ingredients:

1 cup mixed salad greens (eg. arugula, lettuce, spinach, swiss chard)
1/8 cup each of:
boiled beets, shredded
cucumber, sliced
mushrooms, sliced
bell peppers, sliced
tomatoes, chopped

1 hard-boiled egg, sliced
½ cup grilled chicken breast, diced
60 ml cheese, shredded

15 ml olive oil
10 ml balsamic vinegar
2.5 ml sugar

Directions:

Combine all salad ingredients. Top with choice of one protein option (egg, chicken, cheese). Whisk together ingredients for the dressing and drizzle over salad.

Per one serving.

Nutritional Info:

2 ½ servings of fresh BC vegetables in one meal.

Winter

Breakfast:

Seasonal Scramble

Ingredients:

2 large eggs
50 ml cheese, grated
2 ml 1% milk
1 ml salt
10 ml butter
65 ml mushrooms, chopped (~20g)
20 ml onions, minced (~10g)
50 ml tomatoes, diced

1 slice of bread

Directions:

Whisk eggs, salt and milk together. Add butter to pan on medium head. Cook onion until transparent. Add mushrooms and tomatoes to onion and cook until moisture evaporates and mushrooms are soft. Toast the bread in a toaster. Add eggs and milk mixture to the pan and keep stirring until the egg is solid, but not completely dry. Remove from head and sprinkle on cheese. Serve with toast.

Per one serving.

Nutritional Info:

A great protein-rich way to start the day.

Lunch:

Beaty Mac & Cheese

Ingredients:

125 ml dry macaroni
125 ml cheese, grated
125 ml 1% milk
60 g tomatoes, diced
1 clove garlic, crushed

250 ml mixed salad greens

Directions:

Cook macaroni according to instructions then drain. Add milk and cheese to hot pot and stir until melted. Add tomatoes and garlic and stir until garlic soft. Add drained macaroni and stir to combine. Serve with side salad.

Per one serving.

Nutritional Info:

A comforting source of Calcium and Vitamin D in the cold of winter.

Breakfast:

BC Toast

(Apple Cinnamon French Toast)

Ingredients:

2 large eggs
62 ml 1% milk
10 ml brown sugar
2.5 ml cinnamon
2 slices of bread
5 ml butter

½ of an apple
2.5 ml cinnamon
5 ml water or apple juice

Directions:

Combine apple, cinnamon, and water in a saucepan over medium-low heat. Stir until apples are slightly softned,

In a bowl combine eggs, milk, brown sugar and cinnamon. Soak bread in egg mixture. Place bread in buttered frying pan on medium heat. Flip bread when golden brown to cook other side. Serve with apple cinnamon mixture on top.

Nutritional Info:

An energy-rich breakfast including all four food groups.

Lunch:

Little Italy Panini

Ingredients:

2 slices of bread
85 g boneless, skinless chicken breast
½ of a sweet bell pepper (red/yellow/orange)
30 g cheese, sliced
62 ml spinach leaves

Directions:

Grill then slice chicken breast. Assemble sandwich with chicken, pepper, cheese, and spinach. Grill in panini grill according to instructions.

Nutritional Info:

A well-rounded meal on those brisk spring days.

Breakfast:

BC Berry Parfait

Ingredients:

80 ml low-fat granola
125 ml low-fat vanilla yogurt
125 ml fresh fruit (eg. blackberries, blueberries, peaches, raspberries, strawberries)

Directions:

Layer 30 ml yogurt, 20 ml granola, and 30 ml of fruit in a small cup and repeat four times.

Per one serving.

Nutritional Info:

Less than 5g of fat, and fewer than 300 Calories.

Lunch:

Grilled Chicken Sandwich

Ingredients:

85 g boneless, skinless chicken breast
2 slices bread
1 Tbsp low-fat mayonnaise
3-4 basil leaves
1 slice tomato
1 lettuce leaf
Salt and pepper

Directions:

Grill chicken breast. Spread mayo on bread slices. Slice chicken. Assemble sandwich with chicken, basil, tomato, and lettuce. Season with salt and pepper.

Per one serving.

Nutritional Info:

Great source of protein, and low in fat.

Appendix 3. Unit number per case, price, size of hot and cold cups and lids provided by BSI Biodegradable Solutions (BSIBS, 2007).

CUPS	1000 cups/case			
	Cold Beverages		Hot Beverages (Ecotainer)	
Size	1-5 cases	50+ cases	1-5 cases	50+ cases
Small (8 oz)	$105.63	$88.41	$109.56	$97.90
Medium (12 oz)	$120.30	$94.32	$122.90	$114.58
Large (16 oz)	$155.00	$119.63	$134.94	$126.49

LIDS	1000 lids/case			
	Cold Beverages		Hot Beverages (Ecotainer)	
Size	1-5 cases	50+ cases	1-5 cases	10+ cases
Small (8 oz)			$49.86	$44.95
Medium (12 oz)	$54.00	$46.48	$53.90	$47.72
Large (16 oz)				

Appendix 4. Unit number per case, price, size of cutlery, straws, and salad bowls provided by BSI Biodegradable Solutions (BSIBS, 2007).

Cutlery (1000/case)		Straws (1000/case)	
Forks		6.25 inches	$25.95
Spoons	$88.00	8.00 inches	$28.95
Knives			

Salad Bowls	250 bowls/case	
Size	1-5 cases	50+ cases
WL16N (8 oz)	$101.81	$81.51
WL08N (16 oz)	$119.37	$92.55

Appendix 5. Unit number per case, price, size of soup bowls, soup bowl lids, sandwich/burger containers, and plates provided by BSI Biodegradable Solutions (BSIBS, 2007).

Soup Bowls	CUPS		LIDS	
Size	50+ cases	150+ cases	50+ cases	150+ cases
CB 47M (12 oz) (1000/case)	$91.76	$65.23	$63.81	$45.67
CB 21M (17 oz) (600/case)	$86.76	$61.73	$52.74	$37.92

Sandwich & Burger Containers	600 containers/case	
Size	1-5 cases	50+ cases
CL 03 Square Clam Shell 15.5 oz	$132.66	$93.86

Plates	1800 containers/case	
Size	1-5 cases	50+ cases
CC 11 7” deep well plates	$212.22	$149.55

Appendix 6. Product comparison for polystyrene cups and sugarcane fibre cups supplied by BSI Biodegradable Solution (BSIBS, 2007).

	Styrofoam	**Fibre trays and containers**
Main Raw Material	Polystyrene: A petroleum by-product (benzene & ethylene) ** a limited, non-renewable fossil fuel resource.*	A natural post-harvested non-GMO farming plant discard. ** An abundant, annually renewable agricultural resource.*
Intended Use	For both hot/cold, solid/liquid food	For both hot/cold, solid/liquid food
Thermal properties	-Excellent thermal insulation at temperatures below melting (65 c). -Freezer friendly -Not microwave or oven safe owing to the potential release of Styrene and Benzene (toxic) Gases. - Low temperature resistance	-Good thermal insulation -Freezer friendly to -25 c -Microwave and oven safe up to 230 c (non-toxic) - Extremely high temperature resistance
Other properties	-Fair stain/cut resistance -Good grease resistance -Excellent water and oil resistance -Easily destabilized by some natural food chemicals (i.e. Lemon rind will "melt"/breakdown Styrofoam)	-Good cut/grease resistance -Good water and oil resistance -Acid resistance
Waste considerations	-non-biodegradable -Recyclable *where facilities exist* -Releases toxins when incinerated	-100% Biodegradable and compostable -Recyclable in conventional paper stream. -No toxic release when incinerated

Appendix 7. Unit number per case, price, and size of cellulose bags provided by BSI Biodegradable Solutions (BSIBS, 2007).

Cellulose Bags	Single cases	20+ cases
6.75 x 9 inches (1000/case)	$185.94	$141.69
11.75 x 15 inches (500/case)	$219.23	$169.61

Appendix 8. Numerical comparison of energy use and light output between standard incandescent bulbs and ES-qualified CFLs (OEE, 2007).

Standard Incandescent Bulb (watts)	**ENERGY STAR Qualified CFL (approximate equivalent watts)**	**Minimum Light Output (lumens)**
40	10	450
60	15	800
75	20	1100
100	29	1600
150	38	2600

Appendix 9. CNA Lighting's full CFL product listing provided by CAN Lighting (CAN Lighting, 2008).

Model EU	Wattage (W)	Lumens (Lm)	Life (Hrs)	Length (mm)	Diameter (mm)	Incandescent Equivalent
EU-9W	9W	550	10,000	103	48	35W
EU-11W	11W	650	10,000	113	48	40W
EU-15W	15W	950	10,000	126	48	60W
EU-20W	20W	1300	10,000	132	48	80W
EU-25W	25W	1600	10,000	150	60	100W
Model EUTQ	**Wattage (W)**	**Lumens (Lm)**	**Life (Hrs)**	**Length (mm)**	**Diameter (mm)**	**Incandescent Equivalent**
EUTQ-20W	20W	1300	10,000	135	48	80W
EUTQ-25W	25W	1600	10,000	158	58	100W

Appendix 10. CNA Lighting's full T5 FLSF product listing provided by CAN Lighting (CAN Lighting, 2008).

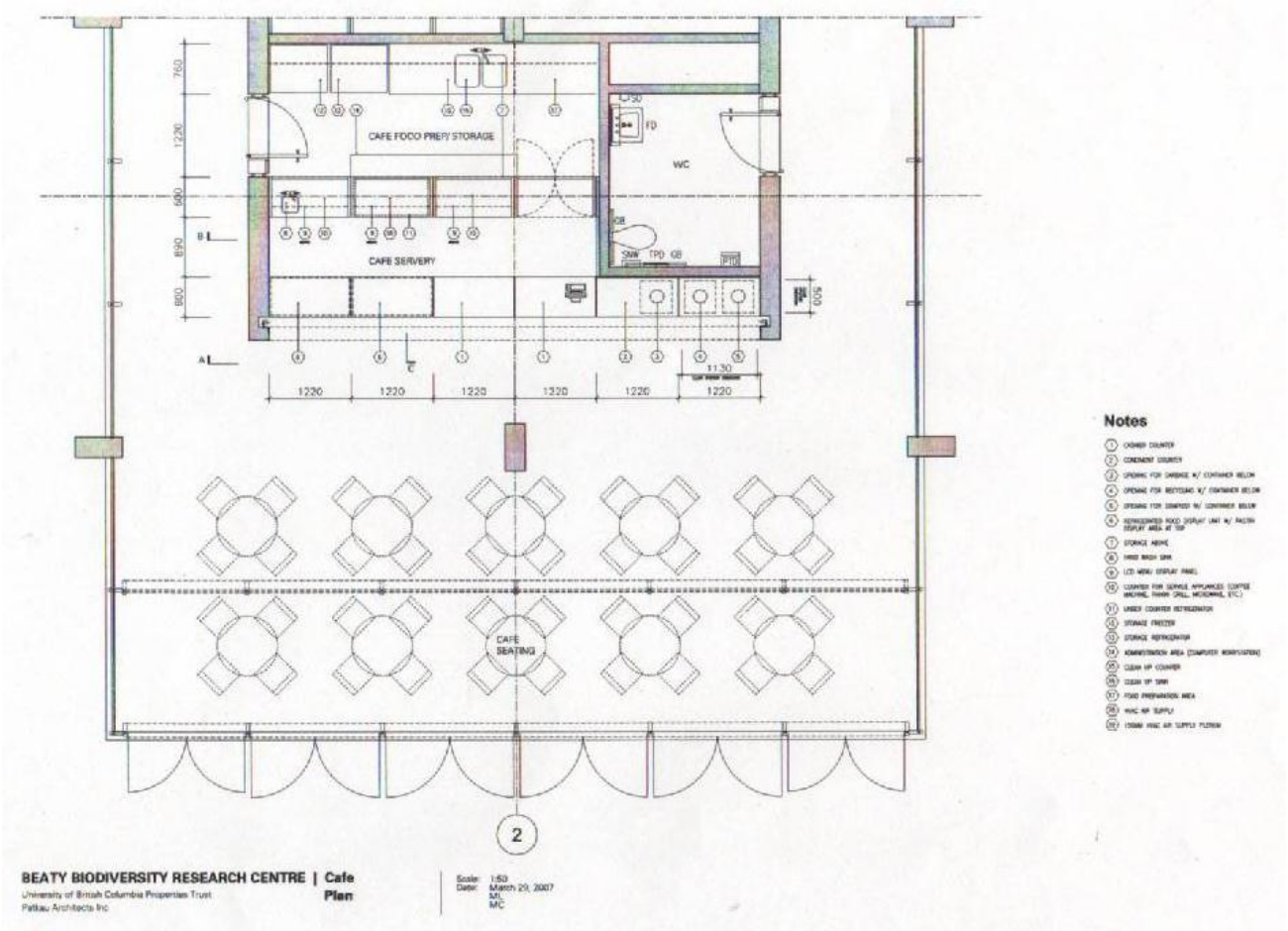
T5 Light Strips	Wattage (W)	Lummens (Lm)	Length (mm)	Rated Life (Hrs)
LS-8W T5	8W	540	343	8000
LS-14W T5	14W	1275	604	8000
LS-21W T5	21W	2000	904	8000
LS-28W T5	28W	2750	1204	8000
Link Cable	**Length**			
LS-Link 150	150mm Linkable Cable			
LS-Link 300	300mm Linkable Cable			
LS-Junction	Junction Box			

Appendix 11. CNA Lighting's full LED Puck Lights product listing provided by CAN Lighting (CAN Lighting, 2008).

Model	**Wattage (W)**	**Beam Angle (Degrees)**	**Life (Hrs)**	**Brightness (Lux)**
PUCK SET (Retrofit Kit)				
LED 30-PUCK SET 30K (Warm White)	4.5W	90°	50,000	33,000
LED 30-PUCK SET 45K (Cool White)	4.5W	90	50,000	33,000
HARD-WIRED (New Contruction)				
LED 30-PUCK 30K	1.5W	90	50,000	11,000
LED 30-PUCK 45K	1.5W	90	50,000	11,000
LED Driver 5W	5W	N/A	100,000	N/A
LED Driver 15W	15W	N/A	100,000	N/A

(CAN Lighting, 2008)

Appendix 12. Beaty Biodiversity Research Centre Café Layout



Appendix 13. Suggested Cooking Appliances provided by Cooking and Warming Equipment (CWE, 2008).

Item	Usage	Estimated Price
George Foreman Grill (with 5 interchange plates)	Grill, Waffle making	$130
Panini Grill	Panini making	$1000
Microwave oven	Reheating	$500
Blender	Mixing ingredient or puree food	$400
Coffer & Espresso Makers	Coffee making	$1000
Electric Induction Cooker	Heat plate for pan or coated pot	$250
Toaster	Bread toasting	$150
Rice Cooker	Rice cooking	$300

Note: The estimated prices vary from brand to brand