UBC Social Ecological Economic Development Studies (SEEDS) Student Report

AGSC 450: Scenario 8 – Assessing the Sustainability of the UBC Food System

Amarjot Aulakh, Christina Bekkers, Arlen Cuadra, Vicki Henley, Day Kwok, Edith Ng, Stacy Robins, Marc Turcotte

University of British Columbia

AGSC 450

April 2, 2003

AGSC 450: Scenario 8 – Assessing the Sustainability of the UBC Food System

Submitted to: A. Rojas
A. Brunetti
April 2, 2003

Group 6: Amarjot Aulakh
Christina Bekkers
Arlen Cuadra
Vicki Henley
Day Kwok
Edith Ng
Stacy Robins
Marc Turcotte

Abstract

Food production and distribution on the UBC campus is conducted through UBC Food Services and AMS Food Services. Presently, [redacted]

[redacted] Through our strong and weak anthropocentric, and community-based values, our group assessed sustainability through indicators such as the number of culturally diverse food establishments in proportion to the number of ethnic populations on campus, the availability of healthy and affordable options, and post-consumer food packaging waste. Our methods of data collection include these social, economic, and ecological perspectives. Social sustainability will be assessed through collaboration between UBC Food Services and AMS Food Services to initiate a planning process with research, implementation, and evaluation proposals for the introduction of more culturally appropriate food establishments for the diverse UBC community. Economic sustainability can be evaluated by data collection and tabulation of the number of healthy meal choices available in increasing price ranges, to provide information such as choice of healthy, complete meals with respect to price. The ecological indicator will be assessed by measuring the amount of noncompostable versus compostable post-consumer food and food packaging waste on campus. As part of our research model, we propose the use of foam laminate products instead of Styrofoam or paper products. [redacted]

Introduction

Sustainability on the UBC campus has not been widely embraced. Currently sustainable projects are underway in small-scale, specific locations. There is a lack of cohesive and extensive projects being undertaken that would reach all facets of the campus. The Campus Sustainability Office does not address food system sustainability specifically except for some remote composting efforts. The three greatest sustainability barriers that this paper will address are the ethnic diversity of options, post-consumer food packaging waste, and the availability of healthy and affordable options. The transition to food sustainability is in its nascent stages at

UBC and is lacking the coordinated effort among departments that would be required for the campus to have a sustainable food system. [redacted]

Background

Food production and distribution on campus is conducted through two groups: UBC Food Services (herein referred to as UBCFS) and AMS Food Services (AMSFS). UBCFS's mission is to "promote and support the University and the greater community by providing good food, friendly service and value, while maintaining financial integrity through dedicated and skilled employees" (UBC Food Services, 2003). It should be noted that there is no mention of sustainability in their mission. They operate numerous food operations such as the cafeterias, snack bars, residence dining rooms, coffee kiosks, and a catering service, among other venues. (UBC Food Services, 2003). The AMSFS operates the majority of the food outlets in the Student Union Building (SUB). AMSFS employees are primarily students. AMSFS offers discounts for those people that bring their own coffee mug or dish. It is also possible to buy Tupperware containers at cost in an effort to reduce the amount of garbage used (AMS, 2003).

UBC opened a Campus Sustainability Office (CSO) in 1998, one year after it created a sustainable development policy. The sustainable development policy outlines UBC's commitment to ecological, economic, and social sustainability on its campus. Their vision is "To earn the respect of future generations for the ecological, social and economic legacy we create" (Campus Sustainability Office, 2003). The CSO has initiated several programs that deal with a variety of sustainability issues on campus. They utilize sustainability coordinators to educate departments and the public about sustainability and how it can be achieved on campus.

The sustainability office also coordinates several programs that address issues of water and energy use and paper recycling. In 1998, the CSO set a five-year target to reduce campus energy and water use by twenty percent. This was achieved through two programs, ECOTrek and ELECTrek. ECOTrek is Canada's largest university energy and water retrofit. ELECTrek is a lighting upgrade project in forty-one buildings that will reduce the annual electricity bill by seven percent. The paper-recycling program has reduced the amount of paper sent to landfills by 2.5 million pounds. One of its goals includes an increase in the use of recycled over virgin paper stock (Campus Sustainability Office, 2003).

Food system sustainability is beginning to be achieved through several initiatives. UBC Waste Management carries out waste reduction programs like composting, recycling and education. Composting at several food providers, such as the Pendulum, Green College, St. John's College, and Acadia Community garden allow recycling of food wastes on campus. Composting methods currently include wormbin, backyard bin, and windrow composting. By the year 2004, UBC hopes to operate a large-scale in-vessel composting system, which would be able to compost three tonnes of organic matter per day. Waste management also conducts several composting workshops and information booths at special events (UBC Waste Management, 2003). Other programs include the UBC Food Co-op Demonstration Garden, Fair Trade Coffee Campaign, UBC Food Co-op, and UBC Farm.

Group Perceptions

Our group has different perceptions about sustainability. The first is a strong anthropocentric view; we believe that human beings advocate keeping a sustainable global or local food system based on their own self-interest, before concerns for the Earth. We believe humans try to protect our natural resources because we have a fear of losing future enjoyment

from these resources. Another belief within our group is a weak anthropocentric view; we believe that humans must take the initiative in controlling the trend towards unsustainability and it is within our power that sustainability can be achieved. We believe that requirements for human survival should not be sacrificed in an attempt to preserve the environment, but rather that humans as a result of the gift given by the environment should seek to protect it. Human practices have led to environmental degradation and now they have the responsibility and to develop and utilize sustainable practices. We also believe in a community-based approach, and that it is not individuals but communities that are important when considering sustainability. Each action that is chosen has an effect upon others and for conflicts to be mitigated it is important that the community is viewed as the bearer of choice, and not the individual. Feenstra describes this sentiment when she states, "not only does an adequate, varied diet contribute to individual health, but the way food is grown, distributed and eaten also profoundly affects the environmental, social, spiritual and economic well-being of the community"(Feenstra, 1997).

Components of the UBC Food System

The UBC food system includes production at 'UBC farm', processing, distribution, use, recycling, and waste disposal. It has several food suppliers external to the campus, which, grouped with our local farm, are the food providers to AMS, our dormitories and all the UBCFS outlets. As with many farms in the Fraser Valley, the UBC farm faces competition for land use. The university would prefer to develop the farmland into housing rather than keep it as an educational facility because of financial pressures. UBC customers place similar demands on UBC processors as outside customers do on processors within their communities. Today's customer is becoming increasingly health consciousness; we demand healthy and affordable food, which must be nutrient-dense but low in fat. We may also have further concern about the

environmental impact of our food system; for example, we may be aware of the **widespread use of Styrofoam containers and be more conscientious in our food choice.** [redacted]

The legal boundaries of UBC are the gates around campus. UBC Proper ends at Wesbrook Mall. However, for the purposes of studying the UBC Food System, we have chosen to incorporate "The UBC Village" because many people eat there and it is within a five minute walk of the residences and the Student Union Building (SUB), which is the practical centre of campus. Most post secondary institutions are in an urban setting whereas the UBC campus is separated from the rest of Vancouver by the University Endowment Lands that create a buffer around the campus and give it the unique feature of an isolated and somewhat self-sufficient microcosm. **From a wider perspective, there does not appear to be any boundaries to the UBC Food System because foods available on campus come from all over the world (coffee from Latin America, yoghurt from Switzerland, etc.). We further acknowledge that food comes from the Lower Mainland, the Fraser Valley, the rest of BC, Canada, North America and the rest of the world.(** [redacted]

The components of the UBC Food System include (in roughly descending size order) UBC Food Services, the Alma Mater Society (AMS) in the SUB, the Village, the UBC Farm, Organic and Whole Food Co-op, Hari Krishna Tuesday Lunch, Food, Nutrition and Health (FNH) Wednesday lunches, Agricultural Sciences Wednesday night barbecues, and various other volunteer run operations. These producers use space, labour, capital, energy, food and packaging to produce and sell food inputs (groceries) and ready-to-consume foods. They also produce waste by-products such as garbage, pollution, and compostable and recyclable wastes. The UBC

campus consumers include students, faculty, staff, residents and visitors. Consumers contribute cash to the production of food products and many contribute labour (paid and volunteer) as well. The linkages and interconnections between components are vast and complex as shown in the diagrammatic representation in Appendix A.

Definition of Sustainability

A definition of the term sustain is **"**to continue without lessening, to nourish, to allow to flourish" (Sustainable Measures, 2000). In order to maintain a sustainable community, we need to balance the connections between the social, economic, and environmental elements ([redacted] . The Bruntland Commission, a United Nations commission on environment and development in 1987, defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Kloppenburg *et al.*, 2000). According to Kloppenburg *et al.* (2000), a sustainable food system is:

- Ecologically sustainable
- Knowledgeable/Communicative
- Proximate
- Economically sustaining
- Direct Participatory
- Just/Ethical
- Sustainably regulated
- Sacred
- Healthful
- Diverse
- Culturally nourishing
- Seasonal/Temporal
- Value-Oriented Economics
- Relational

[redacted]

Social Indicator

The UBC food service system's mission requires the food system cater to the interests of the university community as it pertains to good food, friendly service and value. This is by no means a simple and straightforward task as the university community is an exceedingly heterogeneous group. In the winter session 2002/2003, the total number of registered students in degree programs was 42,763 with 3,342 international students representing 114 different countries (UBC Public Affairs, 2003). The top five countries are USA (14.59%), China (13.21%), Japan (8.45%), South Korea (7.03%) and UK (5.15%). During the academic year of 2002/2003 approximately 71% of the total student body was from the Lower Mainland (UBC Planning and Institutional Research, 2003). This region is enriched by diverse cultures and ethnic backgrounds with its residents speaking more than seventy languages (UBC Student Information, 2003). The university community is inarguably a myriad of cultures embodying the diversity of the Greater Vancouver region, Canada and the world as a whole. The pertinent question is whether the UBC food system has valid expression of this diversity.

UBCFS includes retail operations; residence dining; catering; and the Sage Bistro, a fine dining establishment. The retail operations consist of franchises such as Subway, Bread Garden, Koya Japan, Manchu Wok, coffee bar facilities, in-house cafeterias and restaurants including 99 Chairs, The Barn and Yum-Yums. The AMS food service outlets are all centrally located in the SUB such as Pie-R-Squared, The Pit, The Deli and Pasta Bar. Only three of the fourteen food service establishments named could be considered retail ethnic food providers. Essentially, "Chinese", "Japanese" and "Italian" cuisines are available to the university community; however, they are not nearly sufficient to cater to the sophisticated palates and diverse needs of this population. The societal goals encompass food issues such as providing culturally and

personally acceptable foods in order to ensure that this population enjoys food security. "A community enjoys food security when all people, at all times have access to nutritious, safe, personally acceptable and culturally appropriate foods obtained through normal food distribution channels" (Kalina, 2001).

The UBC food system should be responsible for ensuring food security the incorporation of sustainability as defined by the Campus Sustainability Office. A significant problem to overcome to meet these goals is offering sufficient ethnically diverse food outlets to its community. **Our proposed indicator could be the number of culturally diverse food establishments in direct correlation to the number of ethnic populations with the greatest proportions at UBC** [redacted]

Along with the indicator of the Farrell Research Group Ltd. who conducted the "UBC Food Services-A Survey of Food on Campus" and "Exploring Customer Needs" surveys in 1996/1997 of the UBC and AMS Food Services (Farrell Research Group, 1996) ([redacted]

The surveys were done at the request of the UBC Food Services as they were experiencing some instability in their business. The first survey [redacted] found that the respondents rated variety and cheap pricing as most important in food service overall. "Variety" in the survey was defined as including ethnic foods, selection of vegetarian or healthy food, selection of places to go and obtaining everything they wanted. "It found that 50% of the respondents noted that the variety of food available was poor or fair. Reasons for being poor or fair were they not being given a huge selection or variety in general (49%), food is mostly fast food or greasy (15%) and variety is just alright (11%)" (Farrell Research Group, 1996: [redacted] Data suggested that those individuals younger than 23 years old were a greater ethnic mix and individuals whose mother tongue is Chinese eat on campus more often than individuals whose

mother tongue is English (56% versus 38%). The Farrell Research Group determined that targeting the younger ethnic groups is important. A "dislike" in the UBCFS was low variety (18%) while "more variety" was a preference of the AMS food services (13%). UBC food system customers wanted more Japanese/sushi (14%), Italian/pasta (11%) and vegetarian (10%). The younger generation suggested more Chinese (56%), Japanese (58%) and other Asian cuisine (43%) (Farrell Research Group, 1996). In a second survey, the popularity of East Indian cuisine was evident as students suggested foods such as curries, samosas and vegetarian chili. One of the comments and suggestions for the UBCFS most often given by respondents was to add more variety (Farrell Research Group, 1996). The results of both surveys support the need for improved availability of ethnically diverse food establishments for the community. In doing so it will take a step forward in the direction towards a more socially sustainable food system.

In our proposal the process towards social sustainability can commence in the winter session 2003/2004 as year zero with UBCFS and AMSFS collaborating on a committee to initiate the planning process with research, implementation and evaluation proposals for the introduction of more culturally appropriate food establishments to reflect the diverse cultural needs of the UBC community. By the end of this year the committee should have outlined clear and comprehensive plans for each stage of the process such that Year One will begin with the execution of the research proposals. Research would include measuring out the indicator by comparing the actual number of cultural food establishments to the actual proportions of existing ethnicities at UBC. Research will also target the needs and wants of the community specifically pertaining to cultural foods and food establishments. This again can be done through a survey of students, faculty, staff, and residents addressing what, when, where, why and how to incorporate personally acceptable and culturally appropriate foods. The committee will also research

alternative strategies that other similar microcosms (universities, malls, airports, resorts, cruise ships, etc have incorporated to meet the cultural food needs of their diverse clientele. It will include a complete analysis of the suitability and adaptability these strategies hold for the sustainability goals of the UBC food system: "the synergy between economic, ecological and societal goals" (Campus Sustainability Office, 2003). By Year Two the committee will begin working through the implementation stage in which the results of the indicator analysis, survey and the alternatives review will present the most appropriate proposal that can be implemented to improve the cultural food issues at UBC. Depending on the assessment of the research stage, it can vary from the addition of certain culturally diverse dishes in cafeterias, residence dining and restaurants to an addition of an ethnic food establishment. Both the implementation and evaluation stages will run simultaneously rather than in succession such that the evaluation process commences as soon as the new services have been introduced. The committee will assess the success of a new food service with the UBC food system's social, economic and ecological goals. This pertains to the accessibility, acceptability, quality and value of the food as well as customer service. It considers the financial integrity and, to a reasonable extent, the ecological footprint, a measure of the sustainability of our lifestyles, that purchasing, production, distribution and waste management of the new food service. The three stages will be ongoing processes such that they will continuously measure the movement towards sustainability of the UBC food system and as the UBC community changes, so will the UBC food system. [redacted]

[redacted]

[redacted] [redacted]

Economic Indicator

At first glance, evaluating economic sustainability of the UBC Food System sounds like an evaluation of profitability. In free markets, profit maximization means that a business or a system is competitive in a competitive sector and is generating enough revenue to cover costs, or in economic language, marginal revenue is equal to marginal cost of production (Pindyck and Rubenfeld, 1998). However, the attributes of economic sustainability that we are using for this analysis are not presently quantified in the free market system. It is difficult to measure sustainability in economic terms because it is not a good valued in conventional markets. [redacted]

The UBC Food System economic sustainability indicator for which we were looking at was to measure long-term profitability including the assumption that an operation is only viable in the long-term when it meets the needs of its clients. At UBC there resides the perception of students that the available food choices are expensive (Brunetti, 2002). We speculate that it is limited in healthy options, ethnic diversity and is highly waste generating. Under the operational definition of sustainability "earning the respect of future generations for the ecological, social and economic legacy we create", an indicator of economic sustainability has to go beyond the realm of profitability (Campus Sustainability Office, 2003).

Our group has decided to measure the comparative prices of healthy meals available on the UBC Campus, including the UBC Village. The economic indicator will measure the number of complete meal choices available per price category. Experts in the nutrition field will define "a complete meal." ([redacted]) Their criteria will be based on meeting constraints such as X-number of calories and Y-quality of calories per meal. Once the criterion has been set the nutritionist will conduct a survey on UBC Campus and UBC Village to create a database of the

number of meal choices available in each price range. After the data is analyzed and properly categorized a table such as the following would result.

Table 1: Number of Complete Meals at Specified Prices

	Price Range			
	$2.00-$5.00	$6.00-$9.00	$10.00-$14.00	$15.00+
2003				
2004				
2005				

This table could provide a variety of information such as: choice of "complete meals" with respect to price, overall choice of "complete meals" on UBC campus, and trends over time.

The reason this indicator has been chosen is because of the perception that UBC students are faced with expensive food choices. Through group discussions we began to hypothesize that perhaps the food choices within the UBC boundary are not really that expensive compared to similar "complete meals" around the Lower Mainland and that it was the lack of choice availability that was leading to this perception. If this were true, which we suspect is the case; people would be associating lack of choice with poor value and therefore concluding that UBC food products were over-priced. [redacted]

This indicator is good for several reasons. The first is that data can be easily collected (in less than a day [redacted]) and can be done inexpensively (the cost of one nutritionist and perhaps one assistant). The second reason is that over time this indicator is comparable through calculating all prices into "today" dollars (i.e. discounting). Finally, it is more than just an *economic* indicator as the data table can be used to supplement *social* indicator information.

Ecological Indicator

"The UBC Waste Management Office's mission is to initiate, coordinate and promote both waste and litter reduction through reuse, recycling and composting activities at the University of British

> Columbia. We orchestrate campus recycling activities and provide education and information on waste reduction to the campus community." (UBC Waste Management, 2003)

We, as a group support the mission statement of the UBC Waste Management Office. It is important not only reducing waste but also to educate people about reducing waste. It is important to continually gather information about the amount of waste produced, disposed and recycled. In order to do this, ecological sustainability indicators have to be developed to monitor the amount of waste that is produced at UBC. As a group, we believe that post consumer Styrofoam and paper food packaging is a large part of UBC's waste stream and is a major problem that needs to be addressed as part a sustainable approach to UBC's food system (UBC Waste Management, 1998). Our sustainable approach to the UBC food system strives to reduce the amount of post consumer food packaging waste that reaches the Lower Mainland's landfills. The percent decrease of disposable garbage at UBC over time in conjunction with the percent increase of compostable waste over time will provide an indicator of the ecological sustainability of UBC's food system. By annually measuring the amount of noncompostable versus compostable post consumer food and food packaging waste, the Waste Management division of UBC can determine the ecological sustainability of the UBC Food System. [redacted]

Currently paper and Styrofoam food packages are used as the main form of food packaging in the UBC Food System. Both of these packaging materials are unsustainable because Styrofoam does not biodegrade and paper packaging is covered with waxes, which makes it impossible to recycle (Polystyrene Packaging Council, 2001).

Initiatives have been taken to promote the use of Tupperware containers such as the sale of reusable containers at cost in the AMS Student Union Building (UBC Waste Management, 2003). A $0.15 discount is offered to customers that use their own mug when purchasing coffee

in the SUB. These initiatives are a good start but without proper education and social change it is very difficult to get any effective results.

Today's society has evolved to expect fast and efficient service and products. Urban society in the twenty-first century has an anthropocentric view, which centres human consumption habits on convenience. Ecological factors are not necessarily considered on an everyday basis. This is why even though people have the option and incentives to use reusable containers they do not. Many people merely find it more efficient to use the disposable food packaging that is available from the local food providers than carry around plasticware and mugs all day. We believe that we should aggressively promote the use of reusable food packaging; however, we also recognize that UBC should seriously consider the use of compostable food packaging.

This is why, as a part of our research model, we would like to propose the use of foam laminate products instead of Styrofoam or paper products. Foam laminate is a food packaging material that is made primarily from limestone and potato starch and is one hundred percent biodegradable and recyclable through composting (Earthshell, 2001). This packaging material has all the properties of Styrofoam but is one hundred percent more ecologically sustainable because Styrofoam is not biodegradable. Foam laminate food packaging from Earthshell is currently being used at Oregon State University as a part of its environmental sustainability program to decrease the amount of disposable waste going to landfills (processfood.com). [redacted]

The use of foam laminate packaging at UBC would remove food-packaging waste from garbage going to local landfills. Instead, the foam laminate food packaging, along with any uneaten food could be composted. As a part of Wastefree UBC, a large scale composting facility

has been proposed for South Campus (UBC Waste Management, 2003). By composting food and food packaging materials, UBC Food services could work with UBC Waste Management to minimize large amount amounts of unnecessary waste going to landfills. Setting up compostable material bins next to garbage cans could do this. Such a program has worked very effectively through UBC's Blue Bin Program, which recycles 65 tonnes of containers each year (UBC Waste Management, 2003).

Compost collection bins at UBC would be bright red and follow implementation similar to that of the recycling blue bins. The compost collection bins would be placed next to garbage bins around campus primarily close to food outlets. The collection bins would have to be labelled, showing what items are compostable and which are not – foam laminate food packaging and food scraps, for example. These bins would have to be emptied regularly each day from the loading bay of each building. Currently this is how the blue bin program works and the flow of materials from the bins is monitored (UBC Waste Management, 2003). The flow of compostable materials emptied from the red collection bins can be measured by weight when the bins are emptied. This can be recorded for all the bins and then compared to the amount of garbage going to landfills in the following year. This would provide a sustainable indicator of food service waste flow from UBC. This can be used over the years to see if the composting program is effective or not and to help the university gradually work towards using more compostable materials and less garbage materials flowing from campus.

This system of monitoring compost and garbage materials will also have to be reinforced with social education about the importance of composting and recycling. A plausible idea is the labelling of foam laminate food packaging informing consumers the importance of recycling. The foam laminate packaging label could also indicate that the package should be put in red

compost collection bins across campus to encourage people to use the composting bins. This would ensure a greater number of student participation in the program.

The flow of disposable garbage going to landfills could be monitored and compared to the flow of compostable material going through the compost bins to UBC's large scale composting facility. The percent decrease of post consumer food garbage over time compared to the percent increase of compostable food packaging material over time will provide a long-term indicator of the ecological sustainability of UBC's food system.

Conclusion

Our group has found that there is a lack of cohesion between the UBCFS and the AMSFS and that these groups must become more responsible for their connection to land, food, and the UBC community. The Campus Sustainability Office has initiated several programs that deal with a variety of sustainability issues on campus but does not address the specific issue of food system sustainability. Their composting efforts to deal with ecological sustainability are a start, but they must work with UBCFS and AMSFS to incorporate other issues directly related to the food system such as diversity of appropriate and affordable food choices. Our recommendations on ways to study the UBC Food System include social, economic, and ecological perspectives, and are designed to assess progress over time. Social sustainability will be addressed by the formation of a committee made up of UBCFS and AMSFS. This committee will compare the actual number of cultural food establishments to the actual proportions of existing ethnicities at UBC. Surveys will be done on personally acceptable and appropriate foods, and will determine the most relevant proposal that can be implemented to improve the cultural food issues at UBC. Economic sustainability will be measured by comparing the number of complete, healthy meal choices; determined by experts in the nutrition field, which are available in price categories

ranging from 2-5 dollars up to 15 dollars. Ecological sustainability will be assessed by annual measurement of the amount of noncompostable versus compostable post-consumer food and food packaging waste. The use of foam laminate packaging instead of Styrofoam or paper products has been proposed because it can be composted, and would remove the food packaging waste from garbage going to landfills. It is hoped that future students will have the opportunity to put our recommendations into practice and will become part of the concerted effort to improve the sustainability of the UBC Food System and the campus as a whole.

References

AMS Food Services. 2003. Available at http://www.ams.ubc.ca/businesses/restaurants_and_pubs/index.html. Accessed on March 13, 2003.

Brunetti A. 2002. "Biting into Sustainability: The 2002 UBC Food System Study Report." UBC Campus Sustainability Office, 2002.

Campus Sustainability Office. 2003. Available at http://www.sustain.ubc.ca/. Accessed on March 5, 2003.

Earthshell. 2001. Available at: http://www.earthshell.com. Accessed on March 11, 2003.

Farrell Research Group Ltd. 1996. "UBC Food Services: A Survey of Food on Campus" AGSC 450 Materials. Available at http://www.webct.ubc.ca/SCRIPT/agsc_450/scripts/serve_home. Accessed on March 8, 2003.

Feenstra GW. 1997. Local food systems and sustainable communities. American Journal of Alternative Agriculture. 12 (1); 28 – 36

Field, Barry. 2001. Natural Resource Economics: An Introduction. New York: Irwin/McGraw-Hill.

Kalina L. 2001. Chapter One: "Food Security." Building Food Security in Canada. Kamloops, B.C.: p. 9-20.

Kloppenburg, J., S. Lezberg, K. DeMaster, G. Stevenson, and J. Hendrickson. 2000. Tasting Food, Tasting Sustainability: Defining the Attributes of an Alternative Food System with Competent, Ordinary People. Human Organizations, Vol. 59, No. 2., p. 177-186

Pindyck, R., and D. Rubenfeld. 1998. Microeconomics. Fourth Edition. New Jersey: Prentice-Hall, Inc.

Polystyrene Packaging Council. 2001. Polystyrene and the Environment. Available at: http://www.polystyrene.org/environment/environment.html. Accessed on March 10, 2003.

Sustainable Measures. 2000. Available at http://www.sustainablemeasures.com/Sustainability/index.html. Accessed on March 5, 2003. Maureen Kent, 1998-2000.

UBC Food Services. 2003. Available at http://www.foodserv.ubc.ca/. Accessed on March 3, 2003.

UBC Planning and Institutional Research. 2003. Demographics: Origin. Available at www.pair.ubc.ca/student/demographics.htm#origin. Accessed on March 8, 2003.

UBC Public Affairs. 2003. UBC Facts and Figures: Students. Available at www.publicaffairs.ubc.ca/ubcfacts/index.html#students. Accessed on March 8, 2003.

UBC Student Information. 2003. Living in Vancouver. Available at: http://students.ubc.ca/welcome/living/. Accessed on March 15, 2003.

UBC Waste Management. 1998. The 1998 UBC Waste Audit. Available at http://www.wastefree.ubc.ca/waste-a0.html. Accessed on March 10, 2003.

UBC Waste Management. 2003. Available at http://www.recycle.ubc.ca/rwaste/compost.pdf. Accessed on March 5, 2003.

Wackernagel, M. and W. Rees. 1996. Our Ecological Footprint; Reducing Human Impact on the Earth. New Society Publishers, Canada and Philadelphia, PA USA.