

ASSESSING THE SUSTAINABILITY OF UBC SPROUTS: A COMMODITY CHAIN ANALYSIS

Taimi Thomson, Alia Toots, Burton Tsang, Evelyn Tsang, Grace Tse, Ricky Tse, Jovana

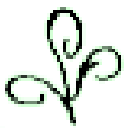
Turkovic

University of British Columbia

AGSC 450

April 10, 2009

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



sprouts

ASSESSING THE SUSTAINABILITY OF UBC SPROUTS:

A COMMODITY CHAIN ANALYSIS

AGSC 450

**UNIVERSITY OF BRITISH COLUMBIA
FOOD SYSTEM PROJECT – SCENARIO 5**

APRIL 2009

TEACHING ASSISTANT: WILL VALLEY

GROUP 26

TAIMI THOMSON

ALIA TOOTS

BURTON TSANG

EVELYN TSANG

GRACE TSE

RICKY TSE

JOVANA TURKOVIC

TABLE OF CONTENTS

| | |
|--|-----------|
| ABSTRACT | 3 |
| RESEARCH QUESTION | 4 |
| INTRODUCTION..... | 4 |
| PROBLEM DEFINITION | 5 |
| VISION STATEMENT & IDENTIFICATION OF VALUE ASSUMPTIONS..... | 6 |
| METHODOLOGY | 8 |
| FINDINGS | 10 |
| DISCUSSION | 17 |
| RECOMMENDATIONS..... | 18 |
| CONCLUSION..... | 20 |
| REFERENCES..... | 22 |
| APPENDIX..... | 23 |

ABSTRACT

The UBC Food System Project is a collaborative, community-based action research project involving multiple partners and collaborators to transform the current UBC food system into a more sustainable and environmental friendly food system. With consultations and continuing dialogue with the project partners and collaborators, the UBCFSP team developed a series of scenarios relating to specific aspects of the UBC food system. The scenario our group had the opportunity to investigate was the sustainability of UBC Sprouts.

Sprouts is a volunteer run organization at the University of British Columbia dedicated to providing the community with sustainable and healthy food. To assess the sustainability of Sprouts, our group decided to conduct a commodity chain analysis of one of their soups. Our research revealed that most of the ingredients of the soup were supplied locally by Discovery Organics. The vegetables for the soup were all produced by farms located within British Columbia. The UBC farm supplies some of Sprouts' vegetables, but is not exclusively used for soup production. It is instead sold at the grocery store section of Sprouts. We examined the kitchen area, as well as the food preparation procedures involved in making the selected soup. Through analyzing the findings, our group was able to generate recommendations regarding the sustainability practices for Sprouts, as well as suggestions for future AGSC 450 students. Our commodity chain analysis confirmed the sustainability of Sprouts, which supports UBC's movement towards a more sustainable and carbon-neutral campus.

RESEARCH QUESTION

Our group will perform a sustainability assessment of Sprouts by conducting a commodity chain analysis of one of their soups.

INTRODUCTION

Over the past ten years, Vancouver's population has grown from 514,000 to 578,000, which is an increase of 64,000 people (City of Vancouver, 2009). As our population continues to grow, it becomes more difficult to pinpoint where our food comes from and how it is processed. Since we rely more heavily on others to prepare our food, we lose control of what we are consuming and the effect this food has on the environment. In an attempt to learn more about the sustainability of our food system at the UBC campus, we have conducted a commodity chain analysis of one of Sprouts' popular soups.

Sprouts is a small, volunteer and student-run grocery store and café located in the basement of the Student Union Building (SUB). Opened in 2004, it is operated by the UBC Natural Food Co-op, which began in 1997 as a bulk buying cooperative. It strives to provide the healthiest, most affordable, and most sustainably produced food to the UBC campus (Sprouts, 2008). It carries a wide variety of freshly made snacks and lunch items, including homemade soups, baked bread, muffins, scones, and vegan cookies. To minimize their environmental impact, Sprouts does not offer disposable cups and dishes. Instead, they recommend students to bring their own eating utensils or have their meals within the café. Grocery shoppers can also find

UBC farm produce, eggs, fair trade beverages and chocolate, and organic bulk dried goods at Sprouts. To augment student accessibility and affordability to minimally packaged organic products, students and community members in the Sprouts Buying Club can purchase items directly from distributors that supply the store.

The focus of our project is to evaluate how sustainable Sprouts truly is, and to help reduce existing barriers to sustainability. Once we have an understanding of how Sprouts obtains its food resources, we can begin to build on recommendations that will contribute to the sustainability of the UBC food system. Our research will collaborate with previous UBC food system projects and the AGSC 450 teaching team, working to improve the existing knowledge with new research and insight. Along with the Sprouts management team and volunteers, we hope our study will help the UBC food system become even more sustainable.

PROBLEM DEFINITION

Numerous institutions ranging from hospitals to schools receive food from large multinational distributors who often lack the knowledge concerning food origin or production methods. Today, most of our food must travel lengthy distances to reach food retailer shelves, food outlets storage rooms, and ultimately to consumers' plates. Consequently, there are fewer fresh food choices and little awareness of where and how food is grown. Currently, a growing number of campuses across the world are participating in a rising campus sustainability movement. This is characterized by an assortment of sustainable initiatives, guiding everything from waste, building design, energy to food procurement. Sprouts is a

participant of this movement. With sustainability as its central guiding principle of operations, Sprouts' mission is to increase campus access to nutritious, local, organic, and fair trade foods at affordable prices. In addition, Sprouts aims to enhance campus community knowledge about health and sustainable food systems, while simultaneously promoting responsible consumption.

Although there has been a rise in sustainable food practices from food providers and grocers, there remains a concern that these sustainable practices may not be, in fact, sustainable. About 15-20% of the produce Sprouts use is from outside of British Columbia (Russell, 2009). Moreover, Sprouts obtains produce from three main distributors who get their products elsewhere. Because of this, we need to develop indicators to determine if Sprouts is meeting the criteria for sustainability. The approach that food services, like Sprouts, produce, process, distribute, package, select, and dispose of food contributes to the "food system crisis". This is demonstrated by resource shortages and prices, global warming, food disease outbreaks, food-related health complications, and environmental degradation (Homer-Dixon, 2006). In this view, Sprouts serves as a localized model of the broader global food system. Through their initiatives, Sprouts can be an exemplary model of sustainable practices for other food operators to follow.

VISION STATEMENT & IDENTIFICATION OF VALUE ASSUMPTIONS

The major focus of the project aims to transform our campus' food service system into an even more sustainable practice. In the seven principles that were developed by our project partners, there is a focus on improving food system issues

that relate to localization, economics, quality of food, training or educating food providers and consumers, and communication between players in the food system.

Our group consists of aspiring students in the field of nutrition, dietetics, and food science. Due to our diverse backgrounds, we originally assumed each would have different value assumptions and comments on the principles of this project. However, upon further discussion, we recognized the similarities in our definitions and concerns. Together, we decided that the most important goal for the project would be to promote awareness of where our food comes from. By analyzing the origins of our food, we can determine its impact on the overall food system.

We discussed the importance of food being both nutritious and enjoyable. There is more to food than calories and nutrients. Just as we spend time to take care of ourselves, we must also devote a portion of our lives to care for our environment through sustainable practices. We believe that many nutrition courses fail to examine environmental or sustainability factors in depth. Since eating sustainably and supporting the local food system can benefit local businesses, we strive to increase our demand for locally produced foods.

Challenges to these goals include industrialization and population growth. For example, in a multi-cultural society like Canada, it is difficult to provide everyone with ethnically diverse foods that are also locally grown. Increasing food production may entail the building of hot houses and bigger farms, which may not be eco-friendly. Since most foods we are accustomed to eating may not be locally produced and processed, it would be a challenge to change one's diet to include exclusively local foods. Although localization and eating locally may seem difficult to

achieve, the localization of waste management at UBC is on the right path. UBC has a solid organic waste system in place, which is supported by many students as a means of returning unused resources back to the earth.

METHODOLOGY

A review of past AGSC 450 papers provided a summary of existing research and guideline for our investigation. Many papers examined sustainability factors by conducting an ecological footprint analysis, while others evaluated methods to enhance sustainable waste management systems at UBC. Our group decided that a commodity chain analysis had yet to be examined for Sprouts, and thus became the option for further investigation. Based on the UBC Faculty of Land and Food Systems, the definition of a commodity chain analysis is “a technique that traces each component of a product from its point of production to its point of consumption” (Group 10, 2004). After speaking with the Community Eats director Heather Russell, she mirrored our enthusiastic view on the value of a commodity chain analysis. A preliminary background research on commodity chain analysis techniques yielded a webpage of a commodity chain analysis of the UBC cinnamon bun (Group 7, 2002). This provided the framework for setting up our analysis for the Sprouts’ soup.

Our group decided the best way to obtain the information we needed was to directly analyze our resource: Sprouts. Our interview questions were designed to inquire how items are produced to how the final product is presented to the customer. In addition to the commodity chain analysis, we also examined the waste management and clean up procedures at Sprouts. To develop a better

understanding of how the system operates, we took the initiative to spend some time at Sprouts. With the help of the Community Eats director, we participated in the making of one of their soups.

After attending the seminar presented by the Sprouts president Martin Gunst, it was revealed that Sprouts could benefit with some form of statistics to demonstrate their sustainability and compare themselves to other food outlets at UBC. Since many of the volunteer staff will be leaving Sprouts to pursue future endeavors, it is important to pass this information to new staff members that will be taking on the Sprouts vision.

We also analyzed the financial state of Sprouts. Instead of investigating the entire budget for Sprouts, which would have been complex and time consuming, we decided to examine the cost and profits of their soups of our commodity chain analysis. This will demonstrate a sample of Sprouts environmental as well as economical sustainability. A few general points will be made on the overall budget of Sprouts.

Once the recipe for the soup was given to the group, we started the commodity chain analysis by contacting farms that supply the distributor. This was done primarily through email with a few phone calls to the distributor. Since the produce ingredients have little processing, the focus was on farming techniques and distance travelled to reach Sprouts.

After summarizing the findings, our group was able to formulate recommendations for Sprouts to help increase their sustainability goals.

Recommendations for future AGSC 450 classes were also generated to continue with the UBC food sustainability project.

FINDINGS

Through communication with Heather Russell, the Community Eats director, and Jeremy Taylor, the Store Coordinator, we discovered that Sprouts places orders from three suppliers: Discovery Organics in Vancouver, Pro Organics in Burnaby, and Horizon Distributors in Burnaby for packaged items. Sprouts does not receive any fruits from the UBC Farm, but occasionally may receive up to 20% of their vegetables, depending on the season. It is important to note that these vegetables from the UBC farm are not used in soups, but are sold at the grocery section of Sprouts. Sporadically, some vegetables are obtained from the LFS garden.

Location of Production

To maintain their sustainability goals, Sprouts aims to obtain the most local foods as possible. About 15-20% percent of their produce comes from outside of BC. This is due in part to cost, since sources are sometimes cheaper, for example, from farms in North Washington. Currently, none of the grains are from BC, but Sprouts will be joining the Grain Initiative lead by Mark Twit in the near future by becoming a shareholder. The lentils and beans that Sprouts use come from within North America. Sprouts does not use any black beans since they are exclusively cultivated in China. The spices are obtained from Dan-D Market, in Vancouver, or in bulk. For the grocery store section of the café, most juices are obtained from BC, while tea

comes from Oregon, fair trade coffee from Mexico, and fair trade chocolate from Ontario. The chocolate involves a lengthy process where cocoa originating from Panama and the Dominican Republic is processed in Switzerland. Also, there are limited places that are certified for producing fair trade chocolate. The milk at Sprouts, Avalon, is sold in glass bottles with a refund given for the return of the bottles.

Transportation

Transportation from the distributor to Sprouts is carried out by trucks with each of the three sources delivering about once a week. UBC recently started a relationship with Discovery Organics, so they will be increasing their number of trips to UBC in the future.

Storage

Storage is rather restricted at Sprouts. They have access to two Alma Mater Society (AMS) kitchens: the preparation kitchen and the catering kitchen. Within the AMS kitchen, Sprouts has access to a 6 by 3 foot fridge with a small freezer that they share with the catering crew. There is also a smaller fridge in the Sprouts café. Since space is not guaranteed, they do not rely on freezing anything.

Processing

No chemicals or other processing techniques are used in the café. Cooking and baking occurs three times a week. Baked goods usually last for a week and are stored in Tupperware reusable containers. For soups, each batch is placed into eight metal trays that are then plastic wrapped and stored in the AMS fridge

(Newson, 2009). Because Sprouts share the plastic wrap with AMS, it is difficult to measure the amount used only by Sprouts. However, since we know the size of the trays (roughly 17" x 24"), it can be estimated that 48 feet of plastic wrap is used per week. This would be about 768 feet of plastic wrap used by Sprouts every semester. The soup is refrigerated and a portion is reheated to serve customers. Usually about 50 bowls of soups are served each day and anything not sold is taken home by the volunteers, minimizing waste production at Sprouts (Taylor, 2009).

After all the baked goods and soup has been prepared for the day, most of the kitchen utensils are cleaned by the sanitizer shared with AMS, while a few items including knives are washed by hand (Newson, 2009). The cardboard boxes that carried the produce are sent to the bailer where it gets compacted, wrapped, and taken off campus by UBC Waste Management. Waste products collected at UBC are recycled into a variety of reusable products (UBC Waste Management, 2009). For example, cardboard boxes are sorted and enter the recycling process to become boxboards or linerboards.

Consumption

Sprouts does not have a to-go container policy, unless customers bring their own containers. This lowers the environmental impact, as well as providing for a friendly eating atmosphere for people to sit down and enjoy their food. There is also no plastic cutlery or napkins provided. Only paper towels are provided since there is limited room for the storage of napkins. Most dishes come from thrift stores or donated by the UBC pottery club.

Waste Disposal

Inside the café, there are garbage, composting, and recycling bins. Old produce that cannot be sold is used in cooking and baking, and in the rare case that the produce spoils, it will be composted. Since they compost as much as they can, they usually fill one bucket each day. The UBC compost crew collects the organic waste, which is subsequently taken to the In-Vessel Composting Facility on South Campus (UBC Waste Management, 2009). In this closed loop system, the compost is used by the UBC gardeners for university landscapes.

Economic Sustainability

The soup sold at Sprouts is marked up by approximately 400%. Their café prices allow Sprouts to keep the prices of everything else down. Moreover, there is no overhead cost, no rent, and the establishment is entirely run by volunteers. The grocery store component of Sprouts provides 25% of their profit from 20% mark up of goods. As for the café section of Sprouts, it makes up 50% of their profit. Finally, the catering component of Sprouts sporadically makes up 25% of their profit. In general, the sales of all items offered by Sprouts more than cover the costs of purchasing and transporting ingredients needed to maintain the café and store.

Strategic Voting Stew

After examining Sprouts' general practices, we decided to focus on one of their soups to conduct our commodity chain analysis. They make such a wide variety of soups and usually do not repeat recipes. Thus, we obtained only one of

their recipes called the *Strategic Voting Stew* which was served in October 2008. The ingredients are listed below, along with their origins.

Strategic Voting Stew – October 2008

| | |
|----------------------------|--------------------------------------|
| <i>Butternut Squash</i> | Cliffe Farms, Armstrong, BC |
| <i>Yukon Gold Potatoes</i> | Across the Creek Farm, Pemberton, BC |
| <i>Parsnips</i> | Similkameen River Farm, Cawston, BC |
| <i>Beets</i> | Myers Farm, Aldergrove, BC |
| <i>Carrots</i> | Destiny Lane, Cawston, BC |
| <i>Turnips</i> | Bhumi Farm, Ashcroft, BC |
| <i>Eggplant</i> | UBC Farm |
| <i>Spices</i> | Various origins |

All the farms are organic and, with the exception of UBC farm, sell to Discovery Organics. Discovery Organics is a retail wholesaler of organic products that originate from all over the Americas. Their focus is to supply people with organic products that are grown in small and local farms. Thus, through their continuing relationship, Discovery Organics help small, local farms stay in business. Additionally, the farms that work with Discovery Organics are all carefully chosen as based on their compassion for the field of organics, and their desire to produce the best food products possible in the most sustainable way.

Cliffe Farms follow strict organic farming practices and has been farming organically since the early 1990s. Although Sprouts receives Butternut squash from Cliffe Farms, they are known for their carrots and are one of the top three organic carrot producers in British Columbia (Discovery Organics, 2009).

Across the Creek Farm started in 1912 and is now one of the few large scale organic potato providers in British Columbia. Not only are they certified organic,

Across the Creek Farm has also proven to produce disease-free potatoes in a highly restricted quarantine area. Their potatoes are now sold across the country to consumers as well as other farmers, and are used frequently in many restaurants in Whistler.

Similkameen River Organics is a certified organic farm that produces a variety of organic vegetables including leaks, onions, summer squash, shallots, potatoes, and parsnips. They have proven to be one of the major organic growers in British Columbia and focus on producing a variety of products to supply to consumers all over the province.

Myers Farm is a family operation that is the major provider of high quality vegetables to a handful of major retailers in Vancouver, as well as six wholesalers who serve organic stores and supermarkets in Manitoba and the Yukon. Occasionally, they overproduce products which get shipped to markets in Washington or Oregon as well as British Columbia when there is a simultaneous shortage.

Destiny Lane farm is a certified organic farm that has redeveloped the vision of using horses to cultivate the land versus using heavy machinery and equipment. They hope to restore the natural ways of farming, while taking into account the affects of farming on wildlife. Destiny Lane receives orders from Discovery Organics approximately once a week, but Discovery picks up produce from other farms along the way to minimize transportation costs.

Bhumi Farm owner Jim McComb has developed a sustainable forestry plan for his land and currently controls a 2000 acre woodlot. Although Jim does supply

organic food products, his real goal is to set up a facility to organically treat fence-posts on a commercial scale for use on organic farms. Bhumi Farm delivers products to Discovery only a few times a year and the crops are then kept in controlled cold storage, which minimizes transportation costs and environmental impacts.

Once each of the above farms has delivered to Discovery Organics, Discovery attempts to enhance delivery efficiency by maximally filling each truck and then ensuring that the shortest routes are taken.

Distances from Farms to Discovery Organics

| | |
|-------------------------------|--------|
| <i>Cliffe Farms</i> | 455 km |
| <i>Across the Creek Farm</i> | 161 km |
| <i>Similkameen River Farm</i> | 351 km |
| <i>Myers Farm</i> | 34 km |
| <i>Destiny Lane Farm</i> | 351 km |
| <i>Bhumi Farm</i> | 337 km |

Distances to Sprouts

| | |
|---------------------------|---------|
| <i>Discovery Organics</i> | 16.4 km |
| <i>UBC Farm</i> | 2 km |

The UBC Farm is a student-driven farm located on the UBC campus. The farm aims to “retain and re-create existing farm and forest lands at the University of British Columbia into an internationally significant centre for sustainable agriculture, forestry and food systems” (UBC Farm, 2009). Although the farm is not currently certified as organic, they do follow all of the Certified Organic Associations of British Columbia (COABC, 2009) guidelines in hopes of producing the best products possible.

The spices used in soup production at Sprouts are all ordered through Frontier Natural Products Co-Op. Frontier ensures that all spices chosen to be a part of their cooperative are sustainably sourced as based on strict high quality standards. They take pride in being able to offer the largest selection of organic seasonings available on the market, and focus on environmental impact in all of their workings.

DISCUSSION

Conducting a commodity chain analysis is known to be an important measure of sustainability for businesses. We chose this technique for Sprouts since it would measure a variety of products while being based on a single commodity, a soup, and it would provide important feedback to Sprouts on where their products really did come from.

After thoroughly conducting a commodity chain analysis of a soup at Sprouts (See Appendix) and then analyzing the findings, we have come to the conclusion that Sprouts is working to provide a highly sustainable environment at the UBC campus. Although some of the products travel from a fairly far distance and therefore may not be considered local, all of the products do come from companies working to produce the best products possible in the most environmentally friendly way.

In comparing our commodity chain analysis with another analysis conducted at UBC, “The UBC Cinnamon Bun: Assessing Sustainability Using Commodity Chain Analysis” (UBC Cinnamon Bun, 2002), we evidently took a more specified route,

clearly locating the origins of all products used in our analysis. While we did not focus on all the individual steps taken to produce each product, we concentrated on where the ingredients came from, how they came to arrive at Sprouts, and where the products went from there. Analyzing the routes taken by each product, we hoped to attain an understanding of the workings of multiple farms, assessing sustainability along each route taken by each product.

Some limitations we found when conducting our analysis were that it is difficult to measure each product specifically. It is also complex to measure the exact costs associated with each product, and thus, may be difficult to generalize our analysis to all of Sprouts. Because each product we examined came from different farms that practice sustainable farming, we could not exactly pinpoint the path taken by each product from soil to table. There are many costs associated with the products that we were unable to measure, mainly being the costs related to producing the products at the farms themselves. However, we did take into account all costs associated with Sprouts which was our main focus. Generalization of our analysis was difficult since Sprouts does not use the same soup recipe twice. However, our group felt that this issue would not undermine our research since Sprouts receives products for all soups from almost all the same places. This allows our commodity chain analysis to apply in a broader spectrum.

RECOMMENDATIONS

As a group, we have compiled a list of recommendations for Sprouts.

- ✓ Identify all the costs associated with producing a specific product on a particular farm. Then compare this with the purchase price of the products.

- ✓ Consider seafood options on the Sprouts menu that supports sustainable fishing and/or fish-farming practices. Similarly, meat purchases at Sprouts can support farms that raise animals organically.
- ✓ Consider using environmentally friendly cleaning supplies, like lemon juice, vinegar, baking soda.
- ✓ Consider purchasing some food products from local farmers markets. This would increase the support for the local food system, since many products from Discovery Organics do come from great distances.
- ✓ When making soup containing butternut squash, keep the seeds instead of disposing them. They can be cleaned off and toasted for a tasty snack for volunteers, or sold to customers. This may be a contribution to Sprouts' revenue.
- ✓ Consider making joint changes with the AMS food and beverage department in regards to purchasing more environmentally-friendly kitchen supplies. This may include:
 - Additional lids for containers instead of using plastic wrap
 - Environmentally-friendly kitchen utensils; for example: wooden cutting boards, wooden spoons, which are biodegradable
 - Energy-saving kitchen appliances.

In addition to the recommendation to Sprouts, we have generated recommendations for AGSC 450 future students.

- ✓ Coordinate with the AMS Catering and food & beverage department to discuss investing in more environmentally-friendly kitchen utensils and appliances, essentially designing improved kitchen facilities.

- ✓ Identify impacts on Sprouts that may result from the plans and construction of a new Student Union Building and incorporate positive changes for Sprouts in those plans.
- ✓ Identify additional ways to extend Sprouts' current practices to a larger scope.
- ✓ Aid in forming a relationship between a local farmers market and Sprouts to further support the local food system.

CONCLUSION

Sprouts holds the distinction of being the only café/grocery store in the lower level of the SUB that is run entirely by volunteers and students. Its mantra is to provide the healthiest, most affordable, and most sustainably-produced food on the UBC campus. This initiative is congruent with UBC's movement towards a more sustainable and carbon-neutral campus. Our group investigated the sustainability of this unique food provider, and provided recommendations to further improve its sustainability. Since Sprouts' soup sales contribute approximately 80% of their sales, we performed a Commodity Chain Analysis for the *Strategic Voting Stew* soup served in October 2008.

The analysis for this soup solidified the current sustainability of Sprouts. We examined the entire soup making process, starting with washing and chopping raw vegetables, steaming, stirring the soup, and storing of the remaining portions. Our findings indicate that Sprouts used minimal energy for their electrical appliances, sharing their fridge with the AMS services. Kitchen supplies were environmentally

friendly, and waste generation was minimal. The three main suppliers providing ingredients to Sprouts also share the goal to be sustainable and environmentally resourceful.

Sprouts represents the “little store that could”. Pushed to the brink of bankruptcy, it overcame adversity to become a leader in sustainable practices. In every aspect, Sprouts makes an attempt to put the environment as their top priority. Volunteers continue to build the foundation everyday to provide food for the UBC population. Generating recommendations were a challenging task for our group given that Sprouts is already very sustainable. We hope that Sprouts can implement our colourful suggestions into their routine, and continue to prosper as a key component of the UBC food system.

REFERENCES

- City of Vancouver. (2009) Planning Department, Statistics and Information. Retrieved April 1, 2009 from <http://vancouver.ca/commsvcs/PLANNING/stats.htm>
- COABC. (2009) British Columbia Certified Organic. *Certified Organic Associations of British Columbia*. Retrieved March 28, 2009 from <http://www.certifiedorganic.bc.ca/index.htm>
- Discovery Organics. (2009) Discovery Organics. Retrieved March 28, 2009 from <http://www.discoveryorganics.ca/farms.html>
- Frontier Natural Products Co-Op. (2009) *Your Source for Natural and Organic Products*. Retrieved March 28, 2009 from <http://www.frontiercoop.com/products/spices.php>
- Group 10. (2004). AGSC 450 2004 Scenario 2A: The True Costs of Food. Retrieved March 25, 2009 from http://www.landfood.ubc.ca/courses/agsc/450/project/files/studentwebsites2004A/Group10/commodity_chain.htm
- Homer-Dixon, T. (2006). *The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization*. Toronto: Alfred A. Knopf.
- Newson, S. Personal communication, March 15, 2009.
- Russell, H. and Taylor, J. Personal communication, February 2009.
- Sprouts. (2008). *Healthy and Sustainable Food at UBC*. Retrieved March 2, 2009 from <http://www.ams.ubc.ca/clubs/nfc/>
- Taylor, J. Personal communication, March 5, 2009.
- UBC Cinnamon Bun (2002) *Assessing sustainability using commodity chain analysis*. Group 7. Retrieved March 10, 2009 from <http://www.landfood.ubc.ca/courses/agsc/450/project/files/studentwebsites2002/Group07/index.html>
- UBC Farm. (2009) *About the UBC Farm*. Retrieved March 28, 2009 from <http://www.landfood.ubc.ca/ubcfarm/about.php>
- UBC Waste Management. (2009). *Composting*. Retrieved March 31, 2009 from <http://www.recycle.ubc.ca/services.htm>.

APPENDIX

Commodity Chain Analysis of *Strategic Voting Stew* (October 2008)

