

UBC Social Ecological Economic Development Studies (SEEDS) Student Report

**Agricultural Sciences 450 The Sustainability of the UBC Food System Collaborative**

**Project III**

**Yuka Asada, Kathleen Condon, Glenda Jackson, Sandy Lee, Erin McMillan, Andrew**

**Smith, Lysa Wone**

**University of British Columbia**

**AGSC 450**

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**Agricultural Sciences 450**

**The Sustainability of the UBC Food System**

**Collaborative Project III**

**Food Mileage (**

For Dr. Alejandro Rojas and Liska Richer, T.A.

March 31, 2004

Group 6:

Yuka Asada

Kathleen Condon

Glenda Jackson EMAILED

Sandy Lee

Erin McMillan

Andrew Smith

Lysa Wone

**Abstract:** *It has been determined by Group 6 in the UBC Food System Collaborative Project of 2004 that the current diagnosis of the UBC Food System is one of unsustainability. Consumers in this food system do not currently view foodstuffs here on campus as affordable or nutritious and the necessary information describing the nutritional aspects of food processed here on campus is absent. More underlying to this unsustainability, is the fact that most of this UBC community does not have adequate awareness of UBC's sustainability initiative. At the root of this unsustainability in the food system, is the management of waste and the efficiency of composting and recycling programs, as well as the excessive mileage that food has traveled to get here to UBC. This lack of environmental responsibility has prompted the formation of the UBC Food System collaborative project, which, since its inception in 2001 has placed incredible pressure on increasing the sustainability of this UBC Food System. Most of the ideals and initiatives responsible for this action here at UBC have been driven by the members of the AGSC 450 – Land, Food and Community student body. This year is no different and Group 6, through a weakly-anthropocentric paradigm, and the evaluation of past groups' achievements, has provided the stakeholders in this UBC Food System with several social, economic, and ecological indicators that will serve to catalyze positive initiatives here on campus, which will drive this food system closer to sustainability. These indicators include the accessibility of affordable and culturally-appropriate foodstuffs, as well as the distance food travels in regards to its environmental costs, thus illuminating the true cost of food to the eye of the consumer. Food mileage could be measured using Weighted Average Source Distancing, including CO<sub>2</sub> emissions and freshness into this food mileage assessment. By emphasizing the impacts of increased distancing of food from the consumer, Group 6 has provided solutions in the form of food mileage labeling, alternative food purchasing, and consumer awareness programs as a means of illuminating the “out of sight, out of mind” mentality that currently plagues the UBC Food System, which serves as a microcosm of the global food system. Through this UBC Food System Collaborative Project, Group 6 has exemplified the vision of UBC's Sustainable Food System initiative and provided the stakeholders with the tools needed to expedite our progress towards sustainability.*

## **Introduction and Problem Definition**

The current unsustainability of the UBC food system as viewed by the Agricultural Sciences 450 students is unquestionable. This has been made evident not only in the on-campus practices of certain stakeholders, but also in the lack of a sustainability clause and food purchasing policy in the UBC Food Services mission statement. Many students do not perceive food prices to be affordable on the UBC campus. Although more nutritious options are becoming available, the majority of food currently offered on campus is not nutritious, nor is nutritional information provided. There is little awareness about sustainability, as well as associated socio-cultural and environmental issues. Waste and its collection and removal are of enormous concern to many of the stakeholders in the UBC Food System Project and these concerns have been expounded in past Food System Collaborative Project proceedings. According to the UBC Waste Management Annual Report from 2002-2003, the campus generates approximately 5,500 tons of solid waste annually. Although there are a number of recycling systems interspersed around campus, these types of systems require substantial improvements to increase the efficiency of on-campus composting and recycling programs in order to divert more solid waste from the landfill. While there are a number of compost bins currently in place in and around the Student Union Building, as well as in junior residences, many students are not aware of their locations. Additionally, current on-campus composting programs are confined to the student union building and junior residences such as Totem Park and Place Vanier.

Food on campus has traveled excessive mileage to reach the consumers at UBC, and food providers

rely very little on locally produced food. The UBC Farm, for instance, has a limited capacity to produce food and an even greater limitation in its capacity to serve the food needs of the UBC community.

Currently it has only provided \$1100 worth of produce to UBC Food Services in 2003 (Sustainability Initiatives-UBC food Services, 2003). Our group has chosen to focus on this food mileage facet of the UBC Food System. Group 6's definition of food miles extends past that provided by the Aldo Leopold Center for Sustainable Agriculture: the distance food travels from the place where it is produced, to where it is consumed. Our definition takes into consideration the distance that food waste must travel in order for it to be disposed of.

### **Value Assumption**

The underlying value assumptions of our group have influenced the direction of our ideas, dialogue and outcomes throughout this project. Most members in our group felt their paradigm was weakly anthropocentric, as they consider humans and their needs to be of central concern, while recognizing the effects of their actions on their surroundings. Some members, with stronger environmental ties, would be more accurately categorized in the eco-centric paradigm. Although these individuals have a strong inherent appreciation of nature, our divergent views did not cause any unresolved differences within our team.

The academic composition of our group included: five Nutrition and Dietetics students, and two Agroecology students. As all members of our group have completed Land, Food and Community I, II and much of III, we have explored similar educational material and epistemologies in this area of study.

This series of courses stressed the need for ecologically, economically and socially sustainable practices through a coordinated, community-based and holistic effort. We believe that the latter should be a goal for the UBC Food System, thus allowing it to offer nutritious, culturally acceptable and affordable foods.

### **Rationale for Selection of Best Model**

From the Four Best UBCFSS 2003 Papers, our group agreed that Group 9 developed the best model for guiding our transition towards a more sustainable food system. The model shows an understanding of the systems concept by overlapping the three components of sustainability and creating indicators such as social-economic and ecological-social. This idea is mapped out in a comprehensible amoeba diagram, which is visually effective in representing the subcategories. As well, the chosen indicators correspond to the measures that our group feels are appropriate; especially the economic indicator of profitability of the food system and the social indicator of availability and acceptability of foods.

### **Assessment of Group 9's Problem Definition**

Although we felt that Group 9 had the best model from the 2003 UBC Food System collaborative project, their problem definition provided few other considerations. First, the importance of the nutritional value of foods was neglected. In order to be sustainable, a food system must support the well-being and health of its members. Further, their problem definition overlooked the importance of food security: that all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life (Agriculture

Canada, 1999). They did mention that foods on campus need to be more affordable to students in order to achieve economic sustainability not just by food service providers, but every member of the UBC Community. Food providers need to be able to cover their costs and make a profit. However, everyone on campus needs to have access to affordable and nutritionally adequate foodstuffs. What adjustments could be made to ensure that both the food provider profits and food is affordable for the consumer? The issue of affordability is more complicated than was presented. Group 9 did mention the importance of considering food mileage to ecological sustainability, but did not mention the ways in which food mileage could impact food security. If we rely solely on locally grown foods then we are compromising our ability to provide a variety of nutritious foods year round. Also it does not promote equity, but rather inequality. Our group is aware that a more sustainable UBC cannot be developed overnight, and that it will require collaboration and cooperation between all faculty members and UBC residents, but if we recognize the barriers and work to overcome them, we believe that we can change the policies and foster greater sustainability in the UBC community.

### **Assessment of Group 9's Sustainability Indicators**

Overall, we felt that group 9 did an excellent job of choosing indicators that were relevant, easy to understand, based on accessible data, and reliable. As Hart M (2000) describes, these are the attributes that validate an indicator, and for the purpose of this project help to position the UBC Food System in the "Sustainable-Unsustainable" continuum. However, group 9's choice of their indicator to measuring food mileage is not tangible. The data required to determine where all the foods at UBC

come from would be difficult to determine and extremely time consuming, especially when one needs to consider that most of the foods are processed and therefore, may have traveled to several different locations before reaching UBC; or contain many different food types originating from multiple different origins. Thus, Group 9's criteria measuring food miles, is not a good indicator as it is not based on widely accessible data.

The ecological indicators devised by Group 9 can be improved upon with defined levels of acceptable and unacceptable food wastes. Group 9 designated signs of unsustainability as "most of the food waste being disposed in garbage bins," and sustainability as "very low quantity of food waste being disposed in garbage bins." The problem with these statements is that 'most' and 'very low' are subjective and unquantifiable terms. This indicator requires calculable measurements for the proportion or percentage of food wasted.

The other indicators used by group 9 were excellent as were the methods to measure them. It is difficult however, to locate the UBC Food System on the "Sustainable-Unsustainable" continuum based on the information provided. Group 9 suggested there be four levels on their continuum: unsustainable, minimally sustainable, intermediately sustainable, and sustainable. Each indicator provided would be measured and then the average value would be taken for all the indicators, and this value would then be used to locate the UBC Food System on the "Sustainable-Unsustainable" continuum.

This model assumes that all the indicators hold an equal weight and importance. Although the four levels provides a subjective measurement, our group feels that this view is an oversimplification of



reality and assumes that everyone has the same definition of the ambiguous term sustainability. We feel that each indicator should be assigned a value and situated in its own continuum. This way all the continuums as well as each individual indicator would be monitored to achieve the overall goal of a sustainable UBC Food System.

### **Our Sustainability Indicators**

After discussing group 9's model in detail, our group identified three indicators to assess the contribution of food mileage to the overall sustainability of the UBC food system.

#### Social Indicators

Our group has identified three social indicators. The first indicator is the accessibility to a wide variety of culturally appropriate and diverse meals. Foods must be culturally acceptable among members of the UBC community since many people with diverse ethnic backgrounds are a part of this food system. Second, the system must provide nutritious meals to enable staff and students to achieve optimal *health*. Finally, the level of knowledge about food security is a key indicator because the knowledge level of the community will influence food choices and purchases.

A qualitative survey directed at consumers (Appendix B) can be used to assess what ethnic foods are available on campus and the level of satisfaction felt by its members. An assessment could also be used to determine the UBC Village vendors' views (Appendix A) towards local foods. Overall, these surveys will help to understand the beliefs and perceptions of the availability and accessibility the UBC Food System.

### Ecological Indicator

The ecological indicator selected is the distance that food travels in kilometers from the place of production to the place of consumption (UBC campus). It is worth noting that if a certain food could be produced locally, but production practices are not ecologically sustainable, then our group does not see this as a viable alternative to help increase the sustainability of the UBC Food System. We feel that UBC Food services should take steps to decrease food miles but consideration should also be given to the types of production practices used to produce the food. It is also important for members of the UBC community to recognize and be able to choose nutritious and environmentally friendly products. In order to measure the distance food has traveled, our group has chosen a quantitative method for developing a food mileage labeling system. Food miles can be measured by using the Weighted Average Source Distance equation. Kilometers traveled by a specific menu items should be displayed on the item or on the menu beside the item.

### Economic Indicator

As an economic indicator, we selected affordability of nutritious foods and money saved from compost materials diverted from a landfill. To measure affordability our group proposes to compare the cost of similar foods in different locations through qualitative analysis, involving primary research. For example, we could compare the cost of a sandwich from a downtown vendor to a sandwich from the Deli on campus.

To collect data to measure the indicators our group designed two surveys. One was directed at

food service providers (Appendix A) which assesses the willingness to alter their behavior in order to create a more sustainable UBC; the other was directed at UBC consumers (Appendix B) which assesses their willingness to support businesses that have made efforts towards a more sustainable UBC. The amount of money saved from diverting compostable waste from the landfill could be measured by weighting the truck loads of compost materials brought to UBC's designated site, and then determining the amount of money it would have taken to transport the materials to the dump in Delta.

### **Background on Food Miles (Specific Task 1)**

Before elaborating on the impacts of food mileage and alternatives to their measurement, some background is necessary for a better understanding of their definition and usefulness in assessing sustainability. As was stated earlier, food mileage is the distance food travels from where it is grown to where it is purchased or consumed (Pirog and Schuh, 2002). The current method of measurement used by most institutions is through Weighted Average Source Distance (WASD), which combines the distance from point of origin to point of sale, and the amount of foodstuffs transported (Carlsson-Kanyama, 1997).

#### **The formula for the WASD is:**

$$\text{WASD} = (\sum m(k) \times d(k)) \div (\sum m(k))$$

where:

k = different locations of the production origin,

m = amount consumed from each location of consumption origin, and

d = distances from the locations of production origin to the point of consumption.

(Carlsson-Kanyama, 1997)

This food mileage measurement may be adapted to calculate the amount of fuel use and greenhouse gasses emitted in the distribution of food. By using the information of miles traveled and

CO<sub>2</sub> emissions, consumers can find out the sources of the food item, mode of transportation, miles traveled, as well as relative environmental impact due to transport based on CO<sub>2</sub> emissions. In a report by Pirog and Schuh (2002) they stated that, putting food mileage on food labels provides the consumer with direct knowledge as to the environmental impact of their food and helps guide informed decisions in its purchase.

The idea that locally grown food is more fresh and tastier than food that has traveled across the continent is another benefit of measuring food miles. The Rodale Institute has stressed this idea; using food miles to measure the freshness of food, which is often of greater concern of the consumer. The usefulness of food mileage in the mission for sustainability in food systems seems to be more focused on consumer awareness of the environmental impact of food choices. In this respect, the benefits of measuring food mileage and including it in labeling are far-reaching.

Presenting the university with a dollar value of savings from reduced food miles will encourage policy and procedure changes that will support this cause. Thus, while the use of food miles may not be a feasible means of measuring sustainability directly, they give the consumer the tools they need to make the right choice in purchasing more locally grown food. This leads to an increase in the environmental and social sustainability of our food system by supporting local agriculture, reducing the strain of our food supply on the environment, and making consumers more aware of the true cost of food.

### **Impacts of Distancing Consumers from their Food Source (Specific Task 2)**

The distancing of consumers from their food source is reported to have several negative impacts

including: the disempowerment of consumers, damage to the environment and quality of food, as well as damage to the health of the economy. UBC relies on Sysco, Konings and Central Foods for the majority of their supplies (Brown, 2001). These distributors mainly rely on foods from international origins, resulting in several implications for our community.

Kloppenburg *et al* (2001) states that our food “come from a global everywhere, yet from nowhere that people know in particular. ” The spatial distancing results in a “distance of mind” (Lieblein, 2001), which leads to poor decision-making and an inability to take action or develop local initiatives (Kloppenburg, 1996). Despite UBC being an institute of education, there seems to be very little knowledge about the food system on campus. How are community members encouraged to act responsibly about their food choices when there is little connection to the origins of their food?

In addition, high food transport has negative impacts on the environment and on the food itself. The trains, planes and automobiles used for transport release carbon dioxide and other harmful emissions into the air, which are linked to global warming (Raloff, 2003). Also, cheap subsidized energy lowers the costs of fuel fertilizers, pharmaceuticals, machinery, irrigation, packaging and refrigeration. These technologies, if used in an exploitive manner, can be environmentally destructive (Kloppenburg, 1996).

Not only does the environment suffer, the quality of food itself declines, to keep the food durable during long transport times sacrifices are made in terms of the palatability and nutritional value. As more people consume processed foods many artificial flavors, colors, stabilizers, emulsifiers, sweeteners and preservatives are ingested.

Finally, high food mileage can be economically damaging, as farmers receive only twenty five cents of every dollar that their consumers spend on food (Kloppenburg, 1996). The rest goes to processors, packagers, shippers, advertisers and retailers. Buying locally grown foods will help support local farmers because some of these processes will be eliminated (e.g. packers & shippers) and therefore allow more of the money to go into the farmer's pockets.

#### **Labeling of Food Miles (Specific Task 4)**

To allow consumers to make informed decisions about the food they purchase on campus, our group felt that a food labeling system, which displays the distance a particular food item has traveled, is necessary as it is the first active step towards a more sustainable food system. By using this labeling system, consumers at the campus will gain a better understanding of origin of foods and the environmental impact of its transportation. Our group has decided to use the 'eco-labels' also known as the 'point of sale labels' designed by norms from the Leopold Center for Sustainable Agriculture (Appendix C). The label is easy to comprehend and includes a mileage meter that estimates the environmental impact of its transportation.

The colour and symbol scheme is designed to give consumers a visual view of the quality of a certain item in UBC Food Services in terms of origin of foods, mode of transportation, miles traveled, as well as environmental impact. Green is an indication of environmental friendliness, orange is moderate, while red is used to indicate a high level of environmental damage. Several eco-label examples suggested for use by UBC Food Services menus are included in Appendix C.

### **Assessing Alternative Food Purchasing Options (Specific Task 5)**

The most obvious way to reduce food miles within the UBC Food System is to encourage UBC Food Services to purchase more locally grown foods. Although this initiative sounds appealing, there are some associated consequences including: decreased product availability, increased price, possible negative environmental impacts, and sociological implications.

Sole reliance on local foods means that there will be a decrease in the variety of foods available to consumers. This is because the types of foods that can be produced in a region is dictated by local environmental conditions (i.e. soil and climatic conditions). These environmental limitations lead to a decrease in the seasonal variety of foods that can be produced.

Generally, the labor costs are much higher in North America when compared to a developing country. This leads to higher production costs, which is reflected in the price paid by the consumer. Higher production costs could also result if farmers were forced to diversify their crops in order to meet the market demands of a community which is relying solely on locally produced foods. Typically, when a farmer diversifies their crop, they have to purchase specialized equipment, and incorporate different production practices that increase their costs.

The main reason for increasing the purchasing of locally produced foods is to reduce food miles and to mitigate the associated negative environmental impacts. However, locally produced food does not necessarily mean that it is produced in an ecologically sustainable manner. BC Hot House tomatoes, which are grown in a greenhouse and have a large ecological footprint, may come from as close as Delta

(approx. 30km from UBC). Does this mean that these tomatoes should be purchased over other tomatoes grown in a more ecologically friendly manner, but located further from UBC? Our group believes that steps should be taken to decrease food miles, but consideration should also be taken into the types of production practices used to produce the food. Preference should be given to those producers who are incorporating ecologically sustainable farming practices.

For the reasons aforementioned, our group has come to the consensus that the UBC Food System cannot rely on foods solely purchase from local growers. Rather we would like to see an increase in the purchasing of local foods. UBC Food services should purchase locally grown foods when given the opportunity and preference should be given to foods produced in an ecologically sustainable manner.

### **Strategies to Increase Consumer Awareness of Food Miles (Specific Task 7)**

When dealing with a specific problem such as food mileage, it is essential to raise awareness of the current situation and problem at hand. Awareness can provide consumers with the information necessary to make educated decisions regarding their food purchases. Our group has agreed that our knowledge of food mileage was very limited prior to taking Agriculture Sciences 450. This would lead us to believe that the general population at UBC has very little or no knowledge of food mileage and the implications it can have on the environment in which we live in. We recommend that UBC Food Services implement a campus-wide campaign to raise awareness of this issue. Developing posters to be displayed near food establishments, bus stops, and bulletin boards would help raise awareness. These posters would highlight the major environmental and economical issues surrounding foods with high



food mileage. To supplement the posters, pamphlets would be made available that would provide more detailed explanations of the implications of food miles, and would also explain the designation of foods that would proudly wear a 'low-food-miles' sticker. Once the UBC population is informed about food miles, and is able to recognize foods with low food miles, they will be able to make informed decisions and play an affective role in decreasing food mileage at UBC.

### **Conclusion**

From the 2003/2004 working team project, our group has chosen the best model for measuring the sustainability of the UBC Food System and identified three indicators to assess the contribution of food mileage in moving towards the sustainability UBC Food System. The class of 2004/2005 can now assess the UBC Food System using the chosen indicators and methods of measurement. Both qualitative and quantitative questionnaires will help to determine the community's perception on food security. We feel that implementation of a food mileage labeling system will help to raise awareness to the members of the community, and help to justify the true cost of foods. Further research will need to be conducted with both UBC and AMS Food Services to develop an accurate database of the campus's food suppliers and the location from which the food originates. After assessment of the UBC Food System, steps can be taken to implement strategies that will enable AGSC to build the ideal sustainable Food System. This system can be used as an example for other communities that wish to follow the path towards sustainability.

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**Appendix A**

Questionnaire – Food Service Providers in the Village and West 10<sup>th</sup>

1. Would you purchase more fresh produce from a local source if it could be grown in closer proximity to your business?

2. If the capacity to produce food at UBC Farm were increased would you consider purchasing fresh produce from UBC Farm for sale at your establishment?

3. Would you be willing to enter into a contractual agreement with UBC Farm to produce food for your business?

4. What types of incentives would you view as acceptable in increasing your reliance on locally produced foodstuffs and supporting a local food economy?

**Appendix B**

Questionnaire – UBC Consumers

1. Do you know what food mileage is?

2. What are some of the advantages of food miles?

3. Would you buy a local product (e.g. Apples) that was more expensive than an imported product?

4. “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) From this statement, how would you rate your food security?


5. Are there culturally diverse and appropriate foods available to you on campus?


6. If you wish to add anything to the definition of food security or have any comments, please use the space provided.


## Appendix C


### Examples of food labels


Food miles ecolabel  
Point of purchase:  
U.B.C Farm


**Apples** 

Source: U.B.C Farm  
Food miles (farm-to-store distance): 10 km  
Transported by: 


Transport Environmental Impact: 


**Alberta Beef** 


Source: Alberta  
Food miles (farm-to-store distance): 1159 km  
Transported by: 

Transport Environmental Impact: 

Food miles ecolabel  
Point of purchase:  
Taiwan

**Bananas** 

Source: Taiwan  
Food miles (farm-to-store distance): 6500km  
Transported by: 

Transport Environmental Impact: 

\*Please note that the food miles are calculated by approximate numbers

