

A Feasibility Analysis of Implementing Bioregional Food in  
Dalhousie University's Studley Campus Residence Dining Halls

---

Environmental Problem Solving, ENVS 3502  
Dr. Tarah Wright

Erin Balsler	<i>Environmental Science</i>
Josée-Ann Cloutier	<i>Management</i>
Anna Cross	<i>Environmental Science</i>
Carmen Lishman	<i>Environmental Science</i>
Lilith Wyatt	<i>Environmental Science</i>

April 8, 2005

## Table of Contents

Abstract	3
1.0 Introduction	3
1.1 What is a problem?	3
1.2 How does this relate to Food?	3
1.3 Food and Dalhousie	4
1.4 Aramark	4
1.5 Case for Sustainability	5
1.6 Biases	6
1.7 Research Objectives	6
1.7.1 Primary Objectives	6
1.7.2 Secondary Objectives	6
1.8 Research Questions	6
2.0 Boundaries of the Study	7
2.1 Definition of Key Terms	7
2.2 Scope	7
2.3 Actor Groups	8
2.4 Limitations and Delimitations	9
3.0 Literature Review	9
3.1 Health	10
3.2 Environment	10
3.3 Socio-economics	11
3.4 Case Studies	12
3.4.1 University of Northern Iowa	12
3.4.2 University of Wisconsin- Madison	12
3.4.3 Yale University- Berkeley Campus	13
3.4.4 University of Washington	14
3.5 Conclusion	14
4.0 Methodology	14
4.1 Student Survey	15
4.2 Aramark Interview	16
4.3 Local Farmers' Interviews	17
4.4 Reliability and Validity of Chosen Methods	18
5.0 Results	19

5.1 Student Survey	19
5.2 Aramark Interview	26
5.2.1 Economics:Canmac Economic Ltd <i>Nova Scotia Input Output Economic Model</i> ©	27
5.3 Local Farmers' Interviews	33
6.0 Discussion and Conclusion	34
6.1 Significant Findings	34
6.2 Considerations in Light of Previous Research	35
6.3 Recommendations for Future Research	36
6.4 Conclusions	36
6.5 Acknowledgments	37
Bibliography	37
Appendices	39
A. Talloires Declaration	39
B. Halifax Declaration	40
C. Dalhousie University's Environmental Policy	41
D. Map of Dalhousie university's Studley Campus	42
E. Letter of Intention	43
F. Informed Consent Form	44
G. Student Survey	45
H. Aramark Interview Questions	47
I. Farmer Interview Questions	48
J. Canmac Economic Ltd Nova Scotia Input Output Economic Model Overview	49

## Abstract

This project will examine how much of the food for the dining halls on Dalhousie University's Studley campus come from farms, processors and manufacturers within the Maritime Provinces which include Nova Scotia, New Brunswick and PEI and whether it is feasible to increase that amount. For many environmental, socio-economic, and health reasons it is important to consider where such large quantities of food are purchased from. This project addresses these concerns in addition to examining the feasibility of substituting some of the food currently served in these dining halls with locally grown food. Interviews will be conducted with Aramark, Dalhousie University's food supplier, and local farmers at the Halifax Farmer's Market. The interviews with Aramark determined that an estimated one quarter of food on the average plate is grown within the Maritimes. Aramark would be willing to take food from local farmers if they could supply enough to meet their needs and if the local food is federally inspected. The interviews with local farmers determined that some farmers were interested in supplying Dalhousie University residence dining halls with their products. However, the farmers stated that there are policies that restrict their ability to do so, and no one farm would be able to meet all of Aramark's needs. It was learned that Maritime farmer's are in the process of organizing themselves to meet the institutional demand by gathering their resources as a cooperative to meet the supply and distribution needs. Student questionnaires were also conducted. They determined that students do care where their food comes from and think that locally grown food would support personal health, the environment, and the local economy. However, on average students are not willing to pay more for their meal plans to acquire locally grown food if it would end up costing more. The research showed that it is possible to have more locally grown food in Dalhousie University residence dining halls but that it would require that more students demand it. The study also showed that 2/3 of students would choose sustainable food if it was presented to them as an option.

## 1. Introduction

### 1.1. What is a Problem?

Problems were defined in the *ENVS 3502: Environmental Problem Solving II* as "some unresolved question which presents unusual difficulties, uncertainties, and doubts about how best to proceed towards solving it."<sup>1</sup> However, this construction of a question can be varied and subject to interpretation. People have different backgrounds, different beliefs, and different perspectives and all these contribute to the construction of problems and their subsequent solutions. Problems are not objectively defined; rather they are open to interpretation.

Environmental problems are often the result of human actions, which threaten the health of the biosphere. Thus, "it follows that 'environmental problem solving,' particularly as practiced in 'environmental management' should be concerned with managing human behaviour as well as the biological impacts of that behaviour on the natural world."<sup>2</sup> By managing human actions and decisions, it could be hoped that the environmental degradation that follows can be minimized. However, rarely are these problems easily resolved. Whereas 'tame' problems are easily solvable and the solution is feasible, 'wicked' problems are difficult to define, difficult to acknowledge and even more difficult to solve.<sup>3</sup> This is true for most environmental problems, including the one being defined here: the lack of bioregional food purchasing in Dalhousie University residence dining halls.

### 1.2. How does this relate to Food?

Food, like any industry, has followed the progress of our economic system: from local oriented to one of transnational companies, long-term storage and buying in bulk. The immediate economic benefits from

---

<sup>1</sup> Wright, T. (2004) *Environmental Problem Solving I*. Halifax: Dalhousie University.

<sup>2</sup> Miller, A. (1999) *Environmental Problem Solving- Psychosocial Barriers to Adaptive Change*. New York: Springer

<sup>3</sup> *Ibid.*

such a process overshadow long-term implications of these processes. Whether the science was not advanced enough, or perceptions were not multidimensional enough, this process was not seen as a problem until recently. Food purchasing, especially on a large scale like a university or similar institution, can and has a responsibility to consider the implications that extend beyond economic cost-benefit analysis. Local food purchasing has many benefits. It empowers the local economy, promotes the local community, ensures food safety, reduces transport pollution, and promotes a new healthier way of eating. However, institutional thinking often does not represent the sentiments of its student body. Is this non-local food purchasing a process that can be changed? What are the implications of the change? Is such a change feasible? Why is such a change even important? Often, students are regarded as idealistic with little understanding behind the forces that move our institutions. A move towards utilizing local food sources has benefits that far outweigh the economic and intuitional traditional ones. It is a well researched and well documented area demonstrating that the movement to bioregional foods is both enormously beneficial, and feasible. It is the goal of this project to demonstrate this importance and subsequently assess the feasibility of incorporating such practices in Dalhousie University residence dining halls.

The problem being addressed in this study affects several individuals and groups who may be able to use the results and information in the research for future reference. Both students who live on campus and local farmers are affected by the lack of bioregional food on campus. Students are affected by the quality of food that they eat and farmers are affected by the amount of food that they are able to sell. The results and information generated from this study would be useful for on-campus food decision makers as well as for students who would like to take on future projects related to this problem. The information and results from this study would be applicable to several other universities and institutions with similar food provision services.

### **1.3. Food and Dalhousie**

Dalhousie University in Halifax, Nova Scotia, offers meal plans to several thousand students every year. They do this by outsourcing to a multinational servicing company, Aramark. There are currently four dining halls run by Dalhousie. Three on Studley Campus will be considered for this project: Shirreff Hall, Howe Hall, and Rislely Hall. This project will look at how much food used by these dining halls is non-bioregional and comes from primary producers outside Nova Scotia, New Brunswick and Prince Edward Island. For many environmental, socio-economic, and health reasons it is important to consider where such large quantities of food are purchased from. If some of the food used in dining halls on Dalhousie Campus was purchased from local suppliers and farmers there could be many positive outcomes.

### **1.4. Aramark**

Aramark is an international company specializing in food services for stadiums, arenas, campuses, businesses, and schools. Canadian headquarters are in Toronto, with International headquarters based in Philadelphia.<sup>4</sup> Aramark's aim is to "create and sustain an environment consistent with each school's individual mission and goals."<sup>5</sup> Food purchasing decisions are influenced by student's needs and demands. As a result, Aramark focuses on variety, convenience and nutrition. In order to respond to the demand, Aramark offers eclectic dining and a variety of choices.<sup>6</sup> A recent marketing campaign is the "Real Food on Campus" which suggests they do want to raise awareness about the quality of their food. Aramark has yet to include organic options as part of their strategy in Universities and Colleges. However, they have responded to this market segment by implementing the 'Planet Evergreen' program as part of their environmental program. The program is available through the catering business segment, which has yet to reach the institutional level.<sup>7</sup>

---

<sup>4</sup> Aramark. [www.aramark.ca](http://www.aramark.ca). Retrieved January 25<sup>th</sup>, 2005.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Ibid.*

<sup>7</sup> *Ibid.*

### 1.5. Case for Sustainability

One of the cornerstones of Dalhousie University's "Environmental Policy" is to "become as environmentally sound as allowed by technology, economics and common sense".<sup>8</sup> The proposed feasibility study would help to enforce this and provide information to create an incentive for decision makers at Dalhousie who have the power to make the change happen.

In this policy, it states that Dalhousie is "a corporate citizen" and should play an "exemplary role by ensuring its corporate operations become as environmentally sound as allowed by technology, economics and common sense."<sup>9</sup> Dalhousie University attempted to realize this by committing to improve their ecological footprint and promoting sustainable practices by signing the Halifax Declaration in 1991.<sup>10</sup> The Halifax declaration was created with the notion that "Universities have the responsibility to shape future policies to be sustainable and equitable forms necessary for a better world."<sup>11</sup> Dalhousie University furthered this commitment when it signed the Talloires Declaration in 1999. The Talloires Declaration stemmed from a concern about the "unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources"<sup>12</sup> and goes on to say, "these environmental changes are caused by unsustainable production and consumption patterns."<sup>13</sup> Dalhousie, by signing the Talloires Declaration, Halifax Declaration, and in its environmental policies states that it has a responsibility to endorse sustainable activities and should be a leader in the sustainable university movement. These declarations all promote environmental education, public awareness, environmental responsibility, community involvement, and cooperation and collaboration in order to achieve greater campus sustainability. It is hoped that this research project will provide insight to Dalhousie's administration about one of the many ways it can accomplish the objectives of these commitments. Through this research project, the environmental benefits of bioregional foods can be assessed as well the feasibility of implementing bioregional practices in Dalhousie University. If these research goals are successful, it has the potential to play an important role in achieving Dalhousie's commitment to environmental sustainability. Instead of giving environmental commitments low priority, Dalhousie could progress towards a living example of promoting environmental practices and ecological literacy within its identity.

The class *ENVS 3502: Environmental Problem Solving II: the Campus as a Living Laboratory* introduces students to concepts and methods for analyzing environmental problems and the various environmental problem-solving models."<sup>14</sup> This research is being conducted from a deductive perspective: that is "our research is characterized by the belief that researchers begin with a theory from which they can deduce hypotheses and then test by gathering data."<sup>15</sup> A hypothesis emerged through our literature review that bioregional foods have health, environmental and socio-economic benefits that are not prioritized in our traditional economic system and thus not considered important in purchasing policy for food in University campus residence dining halls. This theory will then be assessed and tested within the university framework through interviews, research and a student survey.

---

<sup>8</sup> Dalhousie University Senate. (1990). Environmental Policy for Dalhousie University. Halifax Dalhousie University. <http://www.senate.dal.ca/listall.cfm?policy=PEPD U&type=P>. accessed January 31<sup>st</sup>, 2005.

<sup>9</sup> *Ibid.*

<sup>10</sup> Dalhousie University Senate (1991) Senate Policy: Halifax Declaration Halifax: Dalhousie University. <http://www.senate.dal.ca/policy.cfm?policy=PHD&type=P>. Accessed January 31, 2005

<sup>11</sup> *Ibid.*

<sup>12</sup> Dalhousie University Senate. (1999) Senate Policy: Talloires Declaration. Halifax: Dalhousie University. <http://www.senate.dal.ca/policy.cfm?policy=PTD&type=P>. Accessed March 31, 2005.

<sup>13</sup> *Ibid.*

<sup>14</sup> "Dalhousie University Academic Time Table 2004/2005" *Dalhousie University*.

[https://admbws.ucis.dal.ca:8000/PROD/fysktime.P\\_DisplaySchedule?s\\_term=200510,200520&s\\_subj=ENVS&format=1](https://admbws.ucis.dal.ca:8000/PROD/fysktime.P_DisplaySchedule?s_term=200510,200520&s_subj=ENVS&format=1) Accessed: 23-03-3005.

<sup>15</sup> Palys, T. (2003). 3<sup>rd</sup> ed. Research Decisions: Quantitative and Qualitative Perspectives. Scarborough, ON: Thomson/Nelson. p. 426

## 1.6. Biases

It is important to recognize that the researchers are students with a pre-conceived notion of environmental “right and wrong” and thus will reflect the ideologies that support local, organic, and bioregional food initiatives. This bias is accounted for by conducting a feasibility study as opposed to direct implementation. By approaching this issue passively and objectively, biases can be minimized. In addition, the recognition of this bias allows for accountability within the research design, research tools and during the assessment of the results. All relevant methodologies, research questions and recommendations must be considered from within an environmental framework.

## 1.7. Research Objectives

As Palys recognizes, “*serious* research cannot begin until the researcher has a focused issue on which to concentrate his or her energies.”<sup>16</sup> Thus, research can be focused by assessing the boundaries in which the research will occur and what the researcher desires to extract from these boundaries. It is important to assess research objectives in order to develop an adequate research design and provide focus to the research.<sup>17</sup> This research is principally exploratory in that the researchers intend to become familiar with the current food provision status in dining halls on Dalhousie campus. Also, to explore any limitations to bringing bioregional food into dining halls from the perspective of food service managers, students and local farmers. The following objectives were identified:

### 1.7.1. Primary Objectives

The main objectives of the research include:

- To assess bioregional food practices in campus residence dining halls via collaboration with relevant actors
- To assess student awareness and opinion on this matter
- To demonstrate the health, environmental and socio-economic benefits of bioregional food

### 1.7.2. Secondary Objectives

Other objectives, while considered important, may not be achieved by this project include:

- To increase education and awareness about bioregional foods and bioregional food practices.
- To contribute to the reduction of Dalhousie University’s ecological footprint
- To assist in Dalhousie’s commitment to the Talloires Declaration and Halifax Declaration

## 1.8. Research Questions

A researchable question is one in which an empirical answer can be derived; they are “specific, limited in scope and related to some empirical reality.”<sup>18</sup> By establishing which research questions that need to be answered, objectivity can be maximized and bias can be minimized. The research questions that are addressed by this research project are:

- Do bioregional practices provide quantifiable benefits to personal health, environment and socio-economic variables?
- What are the current bioregional practices in campus residence dining halls?
- Are there clauses in Aramark’s existing policy that would influence or restrict their ability to use local food from other sources?
- Where do student’s stand in terms of opinion and education on this matter?
- What is the opinion of local food suppliers on this matter?
- Is the implementation of bioregional practices economically and socially feasible?

---

<sup>16</sup> Palys, T. (2003). 3<sup>rd</sup> ed. Research Decisions: Quantitative and Qualitative Perspectives. Scarborough, ON: Thomson/Nelson. p. 67

<sup>17</sup> *Ibid.*

<sup>18</sup> *Ibid.*; p. 52

## 2. Boundaries of Study

### 2.1. Definitions of Key Terms

Terms used in this report will often have two definitions: nominal definition, which is the articulation of the term<sup>19</sup> and an operational definition, which is the application of a specific empirical meaning to a concept.<sup>20</sup> Operational definitions are essential to scientific research: they “are chosen by researchers in order to bridge theory and data.”<sup>21</sup> The important operational definitions for this research project include:

- **Aramark Canada** – A company that provides food and beverage to many healthcare, education and business institutions. Aramark is the company employed by Dalhousie to provide food services in the dining halls.
- **Bioregional food** – Bioregion has been defined as “the basic geographic unit that integrates human governance within ecological law.”<sup>22</sup> For food to be considered bioregional, it must be produced or processed in the same bioregion in which it is being consumed. The definition of bioregional food that will be used for this project is any organic or non-organic food product that is primarily produced in New Brunswick, Prince Edward Island, and Nova Scotia, which then ends up on plates in Dalhousie’s dining halls.
- **Primary Food Production** – This is to specify that food is only bioregional if it is primarily produced and consumed in the same chosen bioregion. This is the initial stage for any food product, as opposed to any subsequent processing of the food. In this study we define primary food production with specific reference to agriculture and food that is grown or raised on farms in a bioregion. For instance, a potato grown in Iowa and processed at the McCain factory in New Brunswick would *not* be considered bioregional food for this project, whereas a potato grown, processed, and consumed in New Brunswick is considered bioregional food to for Dalhousie.
- **Food product** – Food products are any goods that are produced for the purpose of human consumption. In this study the food products of concern are produce (fruits and vegetables), meat, and dairy.
- **Dining Hall** – Facilities on Dalhousie campuses that are used to provide hot and cold meals to students in residence and others who purchase meal plans from Dalhousie food services.
- **Studley Campus Dining Halls**– those dining halls located on Dalhousie University’s Studley campus, including Howe Hall, Shirreff Hall, and Risley Hall.
- **Feasibility** – Whether or not something is feasible. Feasible is defined as “capable of being done or carried out.”<sup>23</sup> For the purposes of this study feasibility is used in reference to socio-economic, environmental, and health factors.

### 2.2. Scope

This research project will focus on the three dining halls on the Studley campus of Dalhousie University (Appendix D) and the students who use these dining halls during the winter 2005 term. The

---

<sup>19</sup> Palys, T. (2003). 3<sup>rd</sup> ed. Research Decisions: Quantitative and Qualitative Perspectives. Scarborough, ON: Thomson/Nelson. p. 426

<sup>20</sup> *Ibid.*; p. 426

<sup>21</sup> *Ibid.*; p. 67

<sup>22</sup> University of Pennsylvania. (1993) Institute for Bioregional Studies./ Accessed January 22<sup>nd</sup>, 2005

<sup>23</sup> Merriam Webster’s Collegiate Dictionary, 1996; p.425

students represent the consumer body and Aramark is the management involved. Aramark's predominant food supplier, Sysco, and potential bioregional food suppliers will be incorporated into this project as they directly or potentially relate to Dalhousie University.

### 2.3. Actor Groups

**Core Actors** are "continuously and intensively involved with the problem and/or issue of concern."<sup>24</sup> In this project they include:

- **Aramark:** As the food service supplier at Dalhousie, they determine the type, quantity, quality and source of food in campus dining halls, making them a key player in the assessment of bioregional initiatives in dining halls.

**Supporting Actors** are less involved but have significant influence on the decision.<sup>25</sup> In this project they include:

- **"Bioregional Food Project Group":** The group that defined the problem. Through conducting the feasibility assessment, it is hoped that greater environmental sustainability and greater ecological literacy on campus can be achieved. These actors are supporting is due to their involvement and influence is limited by other actors and their willingness to cooperate.
- **Consumers:** It is the consumers of Aramark's services who define what should be provided. However, since they have no direct influence on purchasing policies, they cannot direct change only influence it. The consumers are affected by the decisions made by Aramark.
- **Past Food Research Project Groups:** By providing a framework in which to conduct research as well as act as a support mechanism for current findings, these past initiatives assist in driving the bioregional food movement and correlating awareness initiatives.
- **Potential Bioregional food suppliers:** By being able to provide such a service, these actors demonstrate that such an initiative is feasible and act as a support mechanism for such an initiative. This includes the local farmers that were interviewed for this project.
- **Current Aramark suppliers:** By supplying Aramark, these companies have a direct influence on the current bioregional practices at Dalhousie University.

**Should-be Actors** are those who are affected by the issue but are not involved.<sup>26</sup> In this project they include:

- **Environment:** The environment is affected by the transportation and pesticide use required for current food practices
- **Halifax Regional Municipality and surrounding areas:** by currently outsourcing food requirements, the local economy could be suffering. Seeing as Universities should act as models for the surrounding community, their input should be considered in the University's practices.

---

<sup>24</sup> Wright, T. (2004) Environmental Problem Solving I. Halifax: Dalhousie University.

<sup>25</sup> *Ibid.*

<sup>26</sup> *Ibid.*



## 2.4. Limitations and Delimitations

### Limitations

There are certain variables involved in research that cannot be controlled. These are known as limitations.<sup>27</sup> The limitations of this project include:

- **Temporal:** This research project is being conducted for a single term class and must be completed in that period. The complexity of the problem cannot be resolved in one term.
- **Cooperation:** This study is limited by what information employees of Aramark are willing and able to disclose. There may be many limitations of the information they feel comfortable disclosing or are allowed to disclose according to company policy. This would limit achieving the objectives of this study.
- **Legal Limitations:** Legally binding contracts between Aramark and other food distributors may also limit this study.
- **Seasonal Changes:** Seasonal changes in bioregional food availability may also act as a powerful limitation, since the case studies referenced are often located in warmer climates where bioregional food availability does not fluctuate as significantly.
- **Consumer Interest:** If there is too little awareness or concern for the problem and the issues it will make it difficult to get support for the study.

### Delimitations

Limitations can be counteracted by setting out delimitations in the research, or setting the scope of the research in order to make it more manageable.<sup>28</sup> The delimitations of this project include:

- **Operational definitions:** By defining these definitions (refer to section 2.1) as such, the research becomes focused and directed.
- **Population:** By limiting the scope of the research to undergraduate students who have meal plans, farmers with booths at the local farmers market, and the food service manager at Aramark the research methods can be conducted within the period allotted.
- **Geographical:** By limiting the area of the research to the three dining halls on Studley campus at Dalhousie, the research methods will be feasible and accomplishable.
- **Conceptual:** By defining the purpose of the research as a feasibility assessment of bioregional food purchasing in campus residences, any compilation of information can be deemed successful by adding to the education and literacy aspects surrounding food use on campus.

## 3. Literature Review

It can be evidently demonstrated that local food use is a well debated, well researched and controversial issue. However, it can also be demonstrated that it has the potential to benefit peoples' health, their surrounding environment and their economy. This has been proven in several successful case studies.

---

<sup>27</sup> Wright, T. (2005) Environmental Problem Solving II. Halifax: Dalhousie University.

<sup>28</sup> *Ibid.*

### 3.1. Health “*Let food be thy medicine and medicine be thy food*” Hippocrates

A major concern today is the health implications surrounding the quality of food. The benefit of eating locally grown food is a sensible option for various reasons. As a result, people are turning to a sustainable diet, that emphasizes that food be produced, processed and distributed locally so that local farmland is preserved, the local economy is maintained, less energy is wasted for transportation and consumers have fresh foods available, thus promoting the use of seasonal foods.<sup>29</sup> It has also been suggested that by adopting a sustainable bioregional diet, one is more likely to have vegetables as a major food staple: “Dietary patterns that best promote health derive most energy from plant foods, considerably less from foods of animal origin (meat, dairy, eggs), and even less from foods big in animal fats and sugars.”<sup>30</sup> Scientists consistently have demonstrated the health benefits of diets rich in fruit and vegetables, limited in foods and fats of animal origin, and balanced in calories.<sup>31</sup>

There are more nutrients and fewer preservatives in foods that travel shorter distances with minimal time spent on shelves. In order to extend shelf life, industrially produced foods are grown with pesticides, chemical fertilizers, antibiotics, growth hormones and irradiation.<sup>32</sup> On the other hand, local food is minimally processed and does not require harmful substances to preserve its life span. The saying “we are what we eat” is not to be underestimated even if the health effects to eating chemical food may appear gradually over time. Diet has been implicated, in many scientific studies, as a factor in contributing to the onset of chronic disease; increased illnesses, reduced quality of life and premature death.<sup>33</sup> Evidence reveals that diets high in calories, fat, saturated fat, cholesterol, and salt and low in fibre-containing foods are associated with increased risk of chronic diseases such as coronary heart disease, cancer, stroke, diabetes as well as other degenerative diseases such as osteoporosis, hypertension, obesity and neural tube defects. These eight diet-related health conditions together cost society an estimated \$250 billion each year in medical charges and lost productivity.<sup>34</sup> The studies reviewed here and many others denote the serious health implications surrounding food purchasing decisions.

### 3.2. Environment

Factory farming has caused farmers and the environment many problems from “the degradation of the land through the use of chemical fertilizers, pesticides, heavy machinery, monoculture, irrigation and cash cropping, to the creation of human isolation and stress through the minimization of labour, and the financial pressure to continually become more ‘efficient’ as a response to factors beyond the farmer’s control.”<sup>35</sup>

Chemical fertilizers have had detrimental effects on the environment. Many common chemical fertilizers are highly toxic.<sup>36</sup> Pesticides have been common place in Canada for a long time however; Canadian agriculture uses less of these inputs on a per-hectare basis than most European industrialized countries.<sup>37</sup> The Canadian Census of Agriculture 2001 asked farmers if they applied any pesticides (herbicides, insecticides, fungicides) to their crops in 2001 and 73.2% answered in the affirmative.

---

<sup>29</sup> Peters, J. (1997). Community Food Systems: Working Toward a Sustainable Future. Journal of the American Dietetic Association, Vol.97, No.9: 955-956. p.955

<sup>30</sup> Nestle. M. (2002). Food Politics: How the Food Industry Influences Nutrition and Health., University of California Press, 2120 Berkeley Way, Berkeley, CA

<sup>31</sup> *Ibid.*; p.7

<sup>32</sup> Sustainable Table. <http://www.sustainabletable.org/issues/buylocal/>. Accessed Feb 1<sup>st</sup>, 2005.

<sup>33</sup> Frazao, E. (1996). The American Diet: A Costly Health Problem. FoodReview, Vol.19, No.1: 2-6

<sup>34</sup> *Ibid.*

<sup>35</sup> Kneen, B. (1995). From Land to Mouth: Understanding the Food System. NC\_Press Limited, Toronto. p. 48

<sup>36</sup> Canadian Centre for Occupational Health and Safety, <http://www.ccohs.ca/> accessed Jan 30<sup>th</sup>, 2005.

<sup>37</sup> Statistics Canada, 2001 Census of Agriculture: <http://www.statcan.ca/> Accessed Saturday Jan 29<sup>th</sup>, 2005.

However, in both British Columbia and Nova Scotia, only about 48% of farms applied pesticides to their crops.<sup>38</sup>

Genetic diversity, a new agricultural issue, has been greatly reduced by factory farming. At one time “the global food supply was derived from 3000-4000 different crops, we are now dependent upon 20 or 30.”<sup>39</sup> For example, in Canada 75% of the wheat crop comes from four varieties.<sup>40</sup>

These statistics support the theory that the current agricultural system is detrimental to the environment by pesticide run off and impact on human health, as well as implications of genetically modified foods. As Kneen states, “A sustainable food system, by contrast, is by definition rooted in a particular ecology, a particular bioregion, and since these are all different, there will be many different food systems, even though they may share many common features.”<sup>41</sup> Sustainable food production should be alive and dynamic just like a natural ecosystem as opposed to being static and uniform like non-rotated monocultural fields. Biological sustainability requires diversity.

### 3.3. Socio- Economics

Agricultural practices in the United States have changed drastically in the past century. Farmers now account for less than 1% of US population. However, this does not mean that agricultural practices have diminished over this time. Instead, it has evolved from a lifestyle<sup>42</sup> of subsistence to one of big business: farm sizes have increased but the total number of operators has decreased. The United States is also exporting \$50,000 million in agricultural goods, more than 6 times real dollar value than in 1940.<sup>43</sup>

Supporting local food producers has been considered more sustainable and holistic than the industrial approach. This in turn, not only increases the quality of life, it ensures that food choices and a rich lifestyle will be sustained for future generations. The basic challenge in sustainable food production is how to make better use of the available resources. A more sustainable agricultural system integrates natural processes; increases natural capital; minimizes non-renewable resources; increases self reliance and social capital through empowerment; utilizes local knowledge; and enhances the quality of life through these mechanisms.<sup>44</sup>

The question of whether or not emerging local food production and distribution systems are more sustainable than centralized systems has no easy answer. This is at least in part due to the elusiveness of the term sustainability itself. Traditionally, economics has been viewed as a linear system of accumulation. Sustainability is viewed as a holistic approach, which encompasses the costs of health and environment. The shift from subsistence agriculture to factory farming endorsed classical economics but sacrificed other benefits for the sake of monetary ones.

Frances and Anna Lappe argue that the “world food crisis is more accurately described as a world democracy crisis. More and more people are cut out of decision making about life’s essentials such as control over land for farming, seeds for planting, and the means for buying and selling as food moves into fewer and fewer hands.”<sup>45</sup> This dissociation from the person has evolved as agriculture moved from an industry of subsistence to one of industrial - capital mechanisms. However, this movement has resulted in the undermining of the food producers. As David Wheeler argued, “One of the reasons why cooperative food production and distribution proved so popular in the nineteenth century was that the poor

---

<sup>38</sup> Statistics Canada, 2001

<sup>39</sup> Kneen, B. (1995) From Land to Mouth: Understanding the Food System. Toronto: NC\_Press Limited

<sup>40</sup> *Ibid.*; p. 53

<sup>41</sup> *Ibid.*; p.119

<sup>42</sup> Heller, M. & Keoleian, G.A. (2003) Assessing the sustainability of the US food system: a life cycle perspective. Agricultural Systems: 76 pp. 1007–104

<sup>43</sup> *Ibid.*

<sup>44</sup> Pretty, J. (1998) The Living Land - Agriculture, Food and Community Regeneration in Rural Communities. London: Earthscan Publications Ltd. pg 81

<sup>45</sup> Lappe, F. & Lappe, A. (2004) “Diet for a Smaller Planet: Real Sources of Abundances.” Feeding the Future: From Fat to Famine: How to Solve the World’s Food Crises. Ed. Heitzman and Solomon. Toronto: Anansi. p.130

had long suffered at the hands of unscrupulous food producers and vendors who sold adulterated products to the direct detriment of the health and well being of their consumers.”<sup>46</sup> It is this notion that drives the socio-economic component of food use. It not only empowers local farmers, but purchasers can be empowered through their choices by understanding and appreciating where the food is coming from and the effort that has been put into providing it. As literature on the subject becomes more prominent and the market for organic food increases, it is evident that people are beginning to realize the social benefits of buying local goods. The benefits go beyond the realm of the individual, but also permeate society.

### **3.4. Case Studies**

#### **3.4.1. University of Northern Iowa**

Successful projects regarding the implementation of local food purchasing have been documented across the continent. One example of this success is the University of Northern Iowa. The university started to look at the possibility of supporting local food distributors.<sup>47</sup> The rationale for this new approach to food services was based on economics. Iowa spent eight billion dollars annually on food (2000 statistics).<sup>48</sup> It was observed that most of this food was purchased out of state. This loss of capital could be reduced by investing money into locally raised products when these products were in season. It was believed that this support of the local economy would not only strengthen the economy and university community relations, it would provide a mechanism for local ingenuity and promote attempts at more diverse agriculture.<sup>49</sup> However, it must be noted that this effort was not a unilateral one but rather a collaborative effort of institutional food buyers in the region.<sup>50</sup> This program has since expanded to include multiple institutions. For every dollar spent on the project, \$0.65 stayed in Iowa; local farmer’s businesses increased 5-10 percent and all reported satisfaction with the initiative; \$600,000 was spent locally by ten participating institutions.<sup>51</sup> This project was considered a success and for more than economic reasons: an internship program was established; ecologically literacy increased locally; political and ethical ideals were enforced and a renewed spirit within the community.<sup>52</sup>

While this project was largely considered a success, it was not without struggles. Not only did the food buyers have to support and endorse the idea, so did the students. Convenience culture has established a precedence of fast food and expedient choices that people do not correlate with local goods. However, these ideals can change with the educational component of such a program. University of Northern Iowa demonstrates that this was possible. It just takes patience, persistence and enthusiasm.

#### **3.4.2. University of Wisconsin: Madison**

Currently, at the University of Wisconsin - Madison (UWM), there are two food service operations - housing food services and Memorial Union.<sup>53</sup> Since the initiative to bring in local organic foods, both of these operations incorporate local organic initiatives into their catering and everyday service. The Housing Food Service currently services 15,000 meals a day. They have incorporated local organic apples, corn chips and potatoes every week and have organic, non-local items available. They

---

<sup>46</sup>Wheeler, D. & Thomson, J. (2004) “Brand Barons and the Business of Food.” Feeding the Future: From Fat to Famine: How to Solve the World’s Food Crises. Ed. Heitzman and Solomon. Toronto: Anansi. p. 216

<sup>47</sup> University of Northern Iowa Local Food Project. Center for Energy and Environmental Education. <http://www.uni.edu/ceee/foodproject/#c>. accessed: January 31, 2005

<sup>48</sup> *Ibid.*

<sup>49</sup> *Ibid.*

<sup>50</sup> *Ibid.*

<sup>51</sup> *Ibid.*

<sup>52</sup> *Ibid.*

<sup>53</sup> University of Wisconsin- Madison. The College Food Project: UW-Madison Case Study.

<http://www.cias.wisc.edu/uwmad.php>\_Last updated: 2004 by the College of Agricultural and Life Sciences at UW-Madison

often host special events featuring local organic foods as part of an educational campaign surrounding food and food purchasing. In 2000, UWM became the first public university committed to using local food regularly in the residences.<sup>54</sup>

What makes UWM unique is that this initiative began with faculty members and staff. Local farmers were also very involved in the start-up. A collaborative effort between the faculty staff, students and local farmers' co-ops assessed what was feasible at the time. This has evolved to the point where most meetings, conferences and banquets held on campus are catered as local organic.

Now, food services have taken many more steps towards buying local, sustainable foods. The food services staff plan menus, order food, publicize and help kitchen staff prepare meals. In the fall each year, the dining centres serve a meal that is entirely organic locally grown food featuring meat, dairy, carrots, potatoes, celery, apples, watermelon, cabbage, and onions.<sup>55</sup>

In Wisconsin, prices of locally grown and organic items are usually comparable or cheaper than conventional counterparts from distributors; however, they can sometimes be more expensive.<sup>56</sup> Labour has been the biggest challenge for incorporating local organic foods in residence dining halls. There are wage caps on food labourers in Wisconsin, and ordering pre-processed food is more cost-effective. Different municipalities though have different regulations so campuses can afford to pay kitchen staff to peel carrots.<sup>57</sup> If organic or local items cost more than conventional items, food services will charge more for them.

UWM has developed an educational component to this initiative. Students learn about the importance of locally grown, organic, sustainable foods. Flyers and labels help educate them. Sometimes farmers will come and talk to students and dining hall administrators. The media has been involved; they report events that help to educate the public about the benefits of local, sustainable food.

Overall, UWM has realized the economic limitation to incorporating local organic choices into residence dining halls but has been able to overcome this barrier through cooperation by creating the necessary relationships, by setting realistic goals and by maintaining an important educational component to the campaign.

### **3.4.3. Yale University- Berkeley College**

Yale University's Berkeley College began an organic food initiative in the fall of 2003. The year before 15 members of their Yale Student Environmental Coalition (YSEC) branched and formed Food from the Earth, and became devoted to "promoting the use of organic and locally grown food."<sup>58</sup> They began on a small scale with a pilot test selling organic food to get a sense of whether or not the general population would be interested. They began with the local grocery store, Durfee's, when they received a positive response by selling a few organic items - they approached the campus dining halls. The dining halls agreed to serve a few items as a start. The result was a positive one and so students followed up by continuing to encourage the dining halls to serve more organic food.

The administration at Yale was not immediately enthusiastic about this endeavour, so the student group found ways to attract attention and awareness to their campaign. They organized a conference to do just this, and invited Alice Waters, an organic chef, and a Yale parent to be a guest speaker. The turnout for this event was so high the administration began to take note. Berkeley College was chosen as the starting point for this project. The Master of the college, John Rogers, and his wife Cornelia Pearsall,

---

<sup>54</sup> University of Wisconsin- Madison. The College Food Project: UW-Madison Case Study.

<http://www.cias.wisc.edu/uwmad.php>\_Last updated: 2004 by the College of Agricultural and Life Sciences at UW-Madison

<sup>55</sup> *Ibid.*

<sup>56</sup> *Ibid.*

<sup>57</sup> *Ibid.*

<sup>58</sup> Hansen, Erica. The Yale Herald. October 11, 2002 Vol. XXXIV, No. 6 (accessed March 2, 2005)

<http://www.yaleherald.com/article.php?Article=1156>

were in support of the idea. There was also a concentration of environmentally concerned students in the college who would help the project become successful.

Rogers stated the goal of the project was to "[try] to focus on local food by creating relationships with local small farmers who produce good food without synthetic fertilizers and ranches that raise animals responsibly and humanely," he said. "But it's not simply about buying organic food that's not tainted with insecticides and pesticides or meat injected with hormones and antibiotics. It also involves steps like composting the food waste and sending it back to the farmers to grow vegetables for eating."<sup>59</sup>

Aramark, the company who runs Yale Dining Services, still runs the dining halls, but it will cost more to bring in local and organic food, sometimes up to 100% more. President Richard Levin believes that the volume that Yale will be demanding might help lower the costs. The Yale meal plan may or may not rise in price, depending on the extent Yale can absorb the extra costs.

#### **3.4.4. University of Washington**

The University of Washington (UW) Food services were approached by local community food advocate Wendy McClure while they were planning renovations of facilities and menus to attract more students to their facilities and increase revenue. She suggested incorporating local food into the new menu. Jean Michel Boulot, the Head Chef, was very interested in this idea because of the value and quality of the fresh produce found locally and his own concern for the viability of local farmers.<sup>60</sup>

Wendy began working with Cascade Harvest Coalition (CHC) to help the project succeed. Since institutions face certain efficiency constraints within ordering and distribution that limit initiatives such as this one, Cascade Harvest Coalition created a collaborative ordering, delivery and invoicing system to supply UW Food Services with a variety of food in a one-stop-shop.

The project quickly expanded to include residence dining halls and student union building dining facilities. It was funded in large part by the Washington State Department of Agriculture (WSDA), which helped a lot in getting the project going and having the money to raise awareness about the benefits of local food to arouse interest in the students. By the fall of 2003, UW Food Services began serving local food for the full quarter.<sup>61</sup>

There was a strong emphasis placed on education during this project. Firstly, on educating the students who were eating the food, so that they appreciated the work that went into the food and understood the impact they were having by supporting local farmers. Secondly, they emphasized educating the chefs, food services employees, and farmers about one another so they could build a healthy relationship and understand the other's perspective.

#### **3.5. Conclusion**

It is evident that the purchase of local food is multidimensional and its benefits can be viewed on many levels. Often, a solution can be lost in this complexity. It has been demonstrated that solutions are feasible and are being implemented in universities across the continent. These are only a few examples of such initiatives. The problems were tackled from a personal perspective, the issues that were important were isolated, and what could be addressed adequately was attended to. In each of these case studies, a workable solution was created that is flexible as concerns and perceptions evolve.

### **4. Methodology**

The study was conducted to understand the attitudes, knowledge and actions of the students who use the dining halls, the food service providers as well as potential bioregional suppliers of the dining halls. Three methods were used to collect our data: 1) A literature review, which provides information on

---

<sup>59</sup> Hansen, Erica. 2002

<sup>60</sup> Sanger, K. and L. Zenz. Farm to Cafeteria Connections: Marketing Opportunities for Small Farms in Washington State. Washington State Department of Agriculture. Nov 2003. pp. 59-60.

<sup>61</sup> *Ibid.*

the benefits of bioregional foods from a health, environmental and socio-economic perspective as well as review case studies; 2) a student survey, which will allow for an assessment of student opinion and students' knowledge about bioregional foods; and 3) interviews with food services, food suppliers and potential bioregional suppliers, to assess the opinions, policies and information levels surrounding the decisions on food selection and distribution. This process of using multiple research techniques to achieve the same results is known as triangulation.<sup>62</sup> By employing multiple research techniques, the study is more reliable.

#### 4.1. Student Survey (Refer to Appendix G)

##### Sampling Method

The survey was self-administered and used the sampling frame of undergraduate students who ate in the dining halls<sup>63</sup>. This population was required to assess consumers' opinions and education in regards to bioregional foods. The survey was conducted at the following times at the following locations:

• Thursday	02/17/2005	11:30- 13:00	Howe Hall
• Thursday	02/17/2005	17:00- 18:30	Shirreff Hall
• Tuesday	03/01/2005	11:30- 13:00	Risley Hall
• Thursday	03/03/2005	11:30- 13:00	Shirreff Hall
• Thursday	03/05/2005	17:00- 18:30	Howe Hall
• Monday	03/07/2005	17:00- 18:30	Risley Hall

The dining halls were selected as the location of the surveys to increase the efficiency of the research. It was assumed that every student who is leaving the dining halls had eaten there, thus falling into our sampling frame. This method would also increase heterogeneity or diversity<sup>64</sup> in the population. The dining hall also provided a captive audience and eliminated a systematic bias. Non-probabilistic sampling was used with haphazard and purposive sampling method.<sup>65</sup> Verbal permission was requested from the relevant residence life managers: Christine Squire, Shirreff Hall; Joe Laforge, Risley Hall; and Jeremy Eastwood, Howe Hall. Students were shown the Letter of Intention (Appendix E) and Informed Consent Form (Appendix F) and given the survey. Often students left the dining hall in groups, which increased response rates but also increased the influence of other students' opinion on other respondents.<sup>66</sup> Face to face administration also increased the response rate and allowed for any clarification.<sup>67</sup> Students were provided with the opportunity to respond to both quantitative and qualitative questions. This increased the reliability of the survey. Closed-ended questions allowed for easier comparability among respondents whereas open-ended questions allowed the respondents to discuss the issue in their own words.<sup>68</sup>

The survey was relevant to the project because the information gathered provided direction as to what actions affect students' food choices in dining halls as well as assess students' opinion and awareness levels on the issue of bioregional foods. This is important because students are those who utilize the services provided by Aramark and if they view bioregional foods as beneficial and be willing to pay for it, then they should be supplied. Likewise, if students do not see the lack of bioregional foods in residence as a problem, then this issue can be defined as a non-issue: it is the actors involved who

<sup>62</sup> Wright, T. (2005) Environmental Problem Solving II: The Campus as a Living Laboratory. Halifax: Dalhousie University.

<sup>63</sup> *Ibid.*

<sup>64</sup> Palys, T. (2003) Research Decisions: Quantitative and Qualitative Perspectives 3<sup>rd</sup> ed. Scarborough, Ontario: Thomson/Nelson

<sup>65</sup> *Ibid.*

<sup>66</sup> *Ibid.*

<sup>67</sup> *Ibid.*

<sup>68</sup> *Ibid.*

determine the constructions of problems and thus the solutions.<sup>69</sup> The information gathered from this survey can provide information regarding consumer practices as well as act as a mechanism for an adequate education campaign. It also produces information on the opinions of bioregional foods and student eating practices and preferences that can be beneficial to future projects.

### **Procedure**

The procedure for the survey went as followed:

- Created preliminary survey questions and structure
- Conducted pilot tests with tentative survey
- Adjusted surveys according to pilot test feedback
- Submitted survey for ethics approval
- Administered survey during times previously mentioned
- Created Excel Spreadsheet for survey results and filled in

Qualitative data was coded in the following manner: Coded beverages are tea, coffee, water, soft drinks, juice, milk, soy milk, and chocolate milk. Coded bread and wheat products are waffles, French toast, pancakes, toast, bread, bagels, cereal, and muffins. Coded desserts are pie, cookies, ice cream, Jell-O, cake, pudding, and strawberry shortcake. Coded eggs and dairy are any style of eggs, cheese, and yoghurt. Coded fried foods are French fries, hash browns, hamburgers, chicken burgers, veggie burgers, pizza, hot dogs, veggie dogs, poutine, tacos, nachos, and anything that stated grease, crap, processed, or junk. Coded fruits are any type of fruit. Coded meats are fish, pork, ham, beef, chicken, and bacon. Non-responsive any blank answer or nonsense answer. Coded pastas are any style pasta. Coded rice and stir-fry are rice or stir-fry. Coded sandwiches are any type of sandwiches, wraps, pitas, or grilled cheese. Coded soups are any type if soup. Coded veggies are any type of vegetable

- Created graphs to illustrate survey results
- Analyzed data
- Created poster from survey and interview results
- Surveys were to be stored at Anna Cross' house for a period of three weeks after April 8 before being shredded

### **4.2. Aramark Interview (Refer to Appendix H)**

#### **Background**

Aramark supplies the dining halls Sheriff, Risley, and Howe on Studley Campus at Dalhousie University.

#### **Sampling Method**

Lilith Wyatt, in late January, stopped by the Aramark office in the basement of Howe Hall and asked the receptionist if it would be possible to set up an interview with Derrick Hines, the Food Service Director for Aramark at Dalhousie University. Mr. Hines agreed and all parties could be present for an interview on March 3, 2005 at 09:00. In the emails, Lilith informed him that we would be bringing a video camera to record the interview.

Josée-Ann Cloutier and Carmen Lishman met Derrick Hines on March 3, 2005. Ms. Lishman provided Mr. Hines read the Letter of Intention, and signed the Informed Consent Form and the interview began at about 09:10 and ran for 45 minutes. Mr. Hines was videotaped with his permission.

---

<sup>69</sup> Wright, T. (2004) Environmental Problem Solving I. Halifax: Dalhousie University.



The interview was conducted face to face to allow for clarification of the project<sup>70</sup> and to demonstrate the researchers' interest in the pivotal role of Aramark within the project. Due to the nature of the interview format, open ended questions were asked. This was to stimulate information exchange as well as allow the interviewee to determine what information is important.

The interview is important because Aramark plays a key role in the introduction of bioregional foods to campus dining halls. Therefore, it is essential to understand current food purchasing practices, Aramark's policies regarding such purchases as well as their understanding and opinion of the bioregional food issue.

The information gained from the above interview about current food practices in Dalhousie University residence dining halls was input into the Canmac Economics Ltd. Nova Scotia Input Output Economic Model (See Appendix J). The Canmac Economics Ltd. Nova Scotia Input Output Model was used with the permission of Mike Foster, Chief Executive Officer of Canmac Economics Ltd. Mr. Hines stated Aramark serves 1720 students three meals a day, seven days a week for 8 months of the year. Aramark spend \$2 million per year on food. Approximately one quarter of the food on an average plate is from the bioregion. The cost per plate is \$3.74. This model is based on the 1996 data for 43 industries in Nova Scotia that describes the structure and interdependencies in the Nova Scotia economy. The assumption was made that agriculture, as an industry, is in long-run equilibrium, which implies that the values of inputs equals the values of outputs. This was assumed in order to determine the increase in economic output in Nova Scotia if Aramark was to purchase 50% of their food from local Nova Scotia farmers. With this information and the assumptions stated above then the local agricultural sector will receive an increase of \$1.17 million in revenues per year.

## **Procedure**

The procedure for the interview went as follows:

- Derrick Hines was contacted and an interview was requested.
- Conducted pilot test with tentative questions.
- Adjusted questions according to pilot test feedback
- Interviewee was shown consent letter and information letter.
- Interview was conducted according to above statements.
- Results from interview were analyzed with and incorporated into report.
- Information letter, consent letter and notes taken were to be stored at Josée Cloutier's house for three weeks following April 8 then be shredded

### **4.3. Local Farmers' Interviews**

#### **Background**

In an ideal situation relevant to this study, local organic and low impact farmers would be the primary suppliers of Aramark and Dalhousie University food services. Thus, it made sense to interview these potential suppliers to assess their opinion on the matter, as well as the economic and social feasibility of supplying Dalhousie University from a supplier's standpoint. The Halifax Farmers' Market is where local farmers congregate on Saturdays from 08:00 to 13:00 to supply Halifax citizens with local produce and other goods.<sup>71</sup>

#### **Sampling Method**

Josée-Ann Cloutier and Lilith Wyatt met the morning of Saturday, January 30, 2005, at the Keith's Brewery Farmer's Market. They then walked around the market and asked the following local farmers if they would have time the following week for an interview on camera and if so what time: Norbert Kungl,

---

<sup>70</sup> Palys, T. (2003) Research Decisions: Quantitative and Qualitative Perspectives 3<sup>rd</sup> ed. Scarborough, Ontario: Thomson/Nelson

<sup>71</sup> "Halifax Farmers' Market" Farmers' Market Association of Nova Scotia.  
<http://www.nsfarmersmarkets.ca/halifax/main.htm>. accessed: February 27, 2005

Ted Hutton, and Paul Colville. These farmers were selected because they were the most willing to participate in the research- again it was haphazard sampling. On Saturday February 12<sup>th</sup> Norbert Kungl and Ted Hutton were interviewed at their stall at the farmer's market. Paul Colville was interviewed Feb 26<sup>th</sup> at his booth at the market. The interviewees were shown the information letter and consent letter and signed them. The information from the interviews was collected in a non-probabilistic manner. We did not need the data to have statistical significance, since the farmer's were questioned on their personal perspectives on institutionalizing their products. The data was compiled and written in a report. The questions focused mainly on residence dining halls rather than the entire campus to narrow the scope in assessing the feasibility.

Interviewing local farmers was an essential component to the research. By assessing the potential bioregional food suppliers' opinion on the implementation of bioregional practices in campus dining halls, the feasibility of such an endeavour can become known. In addition, the economic and bureaucratic limitations can be assessed from multiple sides, not just from Aramark's perspective. The quantity, quality and price of these products can also be compared to further understand the economic feasibility of the project goal.

### **Procedure**

The procedure for the interviews went as followed:

- Farmers in the Keith's Brewery Farmers' Market were approached about participating.
- Conducted pilot test with tentative questions.
- Adjusted questions according to pilot test feedback
- Interviewees were shown consent letter and information letter.
- Interviewees were conducted according to above statements.
- Results from interviews were analyzed and incorporated into report.
- Information letters, consent forms and notes taken were to be stored at Lilith Wyatt's house for three weeks following April 8 and then were to be shredded.

#### **4.4. Reliability and Validity of Chosen Methods**

As Palys states, "Reliability' is generally synonymous with consistency."<sup>72</sup> Thus, by endorsing triangulation, and providing adequate detail, to ensure reproducibility, for the process of each research tool, reliability was ensured. Not only are multiple research tools being used, but also each tool is being used multiple times: representativeness is achieved within the student survey; and three different local farmers were interviewed. These methods will also support the validity of the research.

Validity is the demonstration that operationalizations accomplish the purpose for which it was intended.<sup>73</sup> By ensuring all research was pertinent to the central problem, bioregional food use in dining halls, validity was reinforced.

Catalytic validity is the idea that the research being conducted will benefit those associated with the research and increase their awareness surrounding the issue researched.<sup>74</sup> This research held catalytic validity because there was a student educational awareness component proposed; it would introduce Aramark to the issue of bioregional food choices on campus; Aramark purchasing processes would be addressed and then students could be informed accordingly. This project is cyclical in nature, as researchers are extracting information from all actors and resources and dispelling this information to the other actors involved in the project.

---

<sup>72</sup> Palys, T. (2003) Research Decisions: Quantitative and Qualitative Perspectives 3<sup>rd</sup> ed. Scarborough, Ontario: Thomson/Nelson p. 63

<sup>73</sup> *Ibid.*

<sup>74</sup> Wright, T. (2005) *Environmental Problem Solving II: The Campus as a Living Laboratory.* Halifax: Dalhousie University.

## 5. Results

### 5.1. Student Surveys

Three hundred seventeen of the 1720 students that live in Dalhousie University Studley campus residences filled out the survey, Food in Residence Dining Halls. A confidence interval shows that 95% of the time the true proportion for any given question will be within plus or minus 1.91% of the current data. Of the sample of 317 students 207 (65.3%) students are in first year, 66 (20.8%) are in second year, 12 (3.8%) are in third year, and 10 (3.2%) are in fourth year. There are 170 (54%) students from urban areas, 146 (46%) students from rural areas, and one student did not indicate where he or she was from. Chi square tests were conducted to determine if location influenced student knowledge and decisions about food. Out of the 317 students surveyed 87(27.4%) are Arts students, 28 (8.8%) are Commerce students, 158 (49.8%) are Science students, and 43 (13.6%) are Undeclared. A chi square test was conducted to determine if the faculty that students were registered under has influenced their knowledge and choices about food. Two hundred thirty six (74.4%) students stated that what they eat is important to them, 75 (23.7%) of students said that what they eat is somewhat important to them, 3 (0.9%) of students said that what they eat is somewhat important to them, and 3 (0.9%) said that what they eat is unimportant to them. The percentages for urban and rural students follow the general trend of the total population (See Table 1). Since  $\chi^2_{df=3}=7.81$  at the 5% significance level, and the obtained  $\chi^2_{df=3}=3.11$  is less than this, the hypothesis that importance of what they eat is dependent on whether students are from rural or urban areas can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students followed the pattern for the total population as well (See Table 1). Since  $\chi^2_{df=9}=16.92$  at the 5% significance level, and the obtained  $\chi^2_{df=9}=1.25$  is less than this, the hypothesis that importance of what they eat is dependent on whether they are Arts, Commerce, Science or Undeclared students can be rejected at the 95% confidence level.

**Table 1: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared student that stated the importance to what they eat.**

	Important	Somewhat Important	Somewhat Unimportant	Unimportant
Total	236 (74.4%)	75 (23.7%)	3 (.9%)	3 (.9%)
Rural	106 (72.6%)	37 (25.3%)	1 (.6)	2 (1.4%)
Urban	130 (76.5%)	37 (21.7%)	2 (1.2%)	0 (0%)
Arts	69 (79.3%)	17 (19.5%)	1 (1.1%)	0 (0%)
Commerce	20 (71.4%)	7 (25%)	1 (3.5%)	0 (0%)
Science	116 (73.4%)	40 (25.3%)	1 (0.6%)	1 (0.6%)
Undeclared	31 (72.1%)	11 (25.5%)	0 (0%)	1(2.3%)

Three hundred five (96.2%) students agreed that their personal health is important to them, 5 (1.5%) students disagreed that their personal health is important to them, and 7 (2.2%) students did not know if their personal health is important to them. The percentage of urban and rural students follows the general trend for the total population (See Table 2). A chi square test was conducted to determine if agreement to the statement that personal health is important to is dependent upon the location of where they are from. Since  $\chi^2_{df=3}=7.81$  at the 5% significance level, and the obtained  $\chi^2_{df=3}=3.11$  is less than this, the hypothesis that importance of what they eat is dependent on whether students are rural or urban can be rejected at the 95% confidence level.

The trend for Arts, Commerce, Science, and Undeclared students follows the general pattern for the total population (See Table 2). Since  $\chi^2_{df=6}=12.59$  at the 5% significance level, and the

obtained  $\chi^2_{df=6} = 2.68$  is less than this, the hypothesis that the importance of personal health is dependent on whether they are arts, commerce, science, or undeclared students can be rejected at the 95% confidence level.

**Table 2: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that responded to: My personal health is important to me.**

	Agree	Disagree	Don't Know
Total	305 (96.2%)	5 (1.5%)	7 (2.2%)
Rural	140 (95.9%)	3 (2.1%)	3 (2.1%)
Urban	164 (96.5%)	2 (1.2%)	4 (2.4%)
Arts	85 (97.7%)	0 (0%)	2 (2.2%)
Commerce	28 (96.6%)	1 (3.4%)	0 (0%)
Science	152 (96.2%)	3 (1.8%)	3 (1.8%)
Undeclared	40 (93%)	1 (2.3%)	2 (4.7%)

Two hundred seventy two (85.8%) students agreed that environmental health is important to them, while 9 (2.8%) of students disagreed, and 35 (11.1 %) said that they did not know if environmental health is important to them. The trend for urban and rural students follows the same trend as the total population (See Table 3). Since  $\chi^2_{df=2} = 5.99$  at the 5% significance level, and the obtained  $\chi^2_{df=2} = 0.088$  is less than this, the hypothesis that the importance of environmental health is dependent on whether students are rural or urban can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students follow the general pattern of the total student population that was sampled (See Table 3). Since  $\chi^2_{df=6} = 12.59$  at the 5% significance level, and the obtained  $\chi^2_{df=6} = 5.99$  is less than this, the hypothesis that the importance of environmental health is dependent on whether students are arts, commerce, science, or undeclared students at the can be rejected 95% confidence level.

**Table 3: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that responded to environmental health is important to me.**

	Agree	Disagree	Don't Know
Total	272 (85.8%)	9 (2.8%)	35 (11.1%)
Rural	125 (85.6%)	4 (2.7%)	17 (5.4%)
Urban	146 (85.9%)	5 (2.9%)	18 (1.1%)
Arts	79 (90.8%)	0	8 (9.2%)
Commerce	22 (75.8%)	2 (6.9%)	5 (17.2%)
Science	136 (86.1%)	5 (3.2%)	17 (10.7%)
Undeclared	35 (81.4%)	2 (4.6%)	5 (11.6%)

Two hundred nine (65.9%) of students agreed that a strong local economy is important to them, while 15 (4.7%) disagreed, and 93 (29.3%) did not know if a strong local economy is important to them. The responses for urban and rural students follow the same trend as the total population (See Table 4). Since  $\chi^2_{df=2} = 5.99$  at the 5% significance level, and the obtained  $\chi^2_{df=2} = 0.91$  is less than this, the hypothesis that the importance of a strong local economy is dependent on whether students are rural or urban can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students follows the trend for the total population (See Table 4). Since  $\chi^2_{df=6} = 12.59$  at the 5% significance level, and the obtained  $\chi^2_{df=6} = 10.73$  is less than this, the hypothesis that the importance of a strong local economy is dependent on whether students are registered as Arts, Commerce, Science, or Undeclared students can be rejected at the 95% confidence level.

**Table 4: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that responded to a strong local economy is important to me.**

	Agree	Disagree	Don't Know
Total	209 (65.9%)	15 (4.7%)	93 (29.3%)
Rural	100 (68.5%)	6 (4.1%)	40 (27.4%)
Urban	108 (63.5 %)	9 (5.2%)	53 (16.7%)
Arts	56 (64.3%)	1 (1.1%)	30 (34.5%)
Commerce	26 (89.6%)	1 (3.4%)	2 (6.9%)
Science	101 (63.9%)	11 (6.9%)	46 (29.1%)
Undeclared	26 (60.5%)	2 (4.7%)	15 (34.8%)

One hundred sixty one (50.8%) students said that they think that having locally grown food in the residence dining halls would support the above values, while 49 (15.5%) disagreed, and 107 (33.8%) students did not know if locally grown food would support the above values. The trend for rural and urban students follows that of the total population (See Table 5). Since  $\chi^2_{df=2} = 5.99$  at the 5% significance level, and the obtained  $\chi^2_{df=2} = 0.43$  is less than this, the hypothesis that the belief that local food choices will promote the above values is dependent on whether students are rural or urban can be rejected at the 95% confidence level. The Arts, Commerce, Science and Undeclared students followed the same trend as the total population (See Table 5). Since  $\chi^2_{df=6} = 12.59$  at the 5% significance level, and the obtained  $\chi^2_{df=6} = 10.73$  is less than this, the hypothesis that the importance of a strong local economy is dependent on whether they are Arts, Commerce, Science, or Undeclared students can be rejected at the 95% confidence level.

**Table 5: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that respond to local foods support the values of personal health, a healthy environment, and a strong local economy.**

	Yes	No	Don't Know
Total	161 (50.8%)	49 (15.5%)	107 (33.8%)
Rural	77 (52.7%)	21 (14.4%)	48 (32.8%)
Urban	84 (49.4%)	28 (16.4%)	58 (34.1%)
Arts	56 (64.3%)	1 (1.1%)	30 (34.5%)
Commerce	26 (89.6%)	1 (3.4%)	2 (6.9%)
Science	101 (63.9%)	11 (6.9%)	46 (29.1%)
Undeclared	26 (60.5%)	2 (4.7%)	15 (34.8%)

Students were asked why they think that having locally grown food available in residence dining halls would support the values of personal health, environmental health, and as strong local economy. Forty students said that local food would support local farmers and businesses and therefore support the local economy. Twenty students said local food traveled less, used less pesticides and preservatives; therefore it is fresher and contains fewer chemicals that would promote personal health. Fifteen students said that local food travels less, reducing greenhouse gases, and uses fewer pesticides, reducing agricultural run off, therefore supporting environmental health. Five students said that international trade is more important than the values of personal health, environmental health and a strong local economy. See Table 6 for the coded responses of students.

**Table 6: Coded reasons given for why local food would or would not promote the values of personal health, a healthy environment, and a strong local economy.**

Coded Response	Number of respondents
doesn't support values in Q4	1
environmental health	15
environmental health, promotes health	2
international trade	5
promotes personal health	20
supports local culture	1
supports local economy	40
supports local economy, environmental health	3
supports local economy, environmental health, promotes personal health	1
supports local economy, promotes personal health	13
non responsive	215

Fifty nine (18.6%) students said that where their food is grown is important to them, 148 (46.7%) said that it was somewhat important to them, 36 (11.4%) said that they did not know if it is important to them, 32 (10.1%) said that it was somewhat unimportant to them, and 42 (13.2%) said that it was unimportant to them. The trend for urban and rural students follows the same pattern as the total population (See Table 7). Since  $\chi^2_{df=4} = 9.49$  at the 5% significance level, and the obtained  $\chi^2_{df=4} = 1.89$  is less than this, the hypothesis that the importance of where their food is grown is dependent on whether students are rural or urban can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students follows the pattern for the total population (See Table 7). Since  $\chi^2_{df=12} = 22.36$  at the 5% significance level, and the obtained  $\chi^2_{df=12} = 7.89$  is less than this, the hypothesis that the importance of where their food is grown is dependent on whether students are Arts, Commerce, Science, or Undeclared students can be rejected at the 95% confidence level.

**Table 7: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that stated the importance of where their food is grown to them**

	Important	Somewhat Important	Don't Know	Somewhat Unimportant	Unimportant
Total	59 (18.6%)	148 (46.7%)	36 (11.4%)	32 (10.1%)	42 (13.2%)
Rural	26 (17.8%)	69 (47.3%)	13 (8.9%)	17(11.6%)	21 (14.4%)
Urban	33 (19.4%)	79 (46.5%)	22 (12.9%)	15 (8.8%)	21 (12.4%)
Arts	19 (21.8%)	45 (51.7%)	9 (10.3%)	4 (4.6%)	10 (11.5%)
Commerce	4 (13.7%)	10 (34.4%)	5 (17.2%)	5 (17.2%)	5 (17.2%)
Science	30 (19%)	76 (48.1%)	14 (8.8%)	21 (13.3%)	17 (10.8%)
Undeclared	6 (14%)	17 (39.5%)	7 (16.3%)	2 (4.7%)	10 (23.3%)

Eight (2.5%) students said that they always know the origin of the food they eat, 35 (11.0%) said they know the origin of their food almost always, 205 (64.7%) said that they know the origin of their food sometimes, and 67 (21.1%) said that they never know the origin of what they eat. The trend for rural and urban students follows the same pattern (See Table 8). Since  $\chi^2_{df=3} = 7.81$  at the 5% significance level, and the obtained  $\chi^2_{df=3} = 4.96$  is less than this, the hypothesis that knowing the origin of their food dependent on whether students are rural or urban can be rejected at the 95% confidence level. The trend for Arts,

Commerce, Science, and Undeclared students follows the same pattern as the total population (See Table 8). Since  $\chi^2_{df=6} = 12.59$  at the 5% significance level, and the obtained  $\chi^2_{df=6} = 2.39$  is less than this, the hypothesis that the knowing the origin of their food is dependent on whether students are Arts, Commerce, Science, or Undeclared students can be rejected at the 95% confidence level.

**Table 8: the number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that know the origin of their food**

	Always	Almost Always	Sometimes	Never
Total	8 (2.5%)	35 (11.0%)	205 (64.7%)	67 (21.1%)
Rural	3 (2.1%)	13 (8.9%)	92 (63.0%)	38 (26.0%)
Urban	5 (2.9%)	22 (12.9%)	113 (66.5%)	28 (16.5%)
Arts	2 (2.3%)	13 (14.9%)	57 (65.5%)	15 (17.2%)
Commerce	1 (3.4%)	4 (13.8%)	18 (62.1%)	6 (20.7%)
Science	4 (2.5%)	15 (9.4%)	106 (67.1%)	32 (20.3%)
Undeclared	1 (2.4%)	3 (6.9%)	24 (55.8%)	14 (32.6%)

One hundred eighty one students (57.1%) said that they eat in the residence dining halls 16 to 19 times per week, 107 (33.8%) eat in there 11 to 15 times per week, 23 (7.3%) said that they eat there 1 to 5 times per week and 2 (0.63%) said that they never eat in the dining halls. The trend for urban and rural students follows this pattern (See Table 9). Since  $\chi^2_{df=4} = 9.49$  at the 5% significance level, and the obtained  $\chi^2_{df=4} = 2.69$  is less than this, the hypothesis that the number of times a student eat in the dining hall is dependent on whether students are rural or urban can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students follows the general pattern for the total population (See Table 9). Since  $\chi^2_{df=12} = 22.36$  at the 5% significance level, and the obtained  $\chi^2_{df=12} = 5.52$  is less than this, the hypothesis that the number of times a students eats in the dining halls is dependent on whether students are Arts, Commerce, Science, or Undeclared students can be rejected at the 95% confidence level.

**Table 9: The numbers of times that Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students eat in the dining halls per week**

	16 to 19	11 to 15	6 to 10	1 to 5	Never
Total	181 (57.1%)	107 (33.8%)	23 (7.3%)	2 (.63%)	2 (.63%)
Rural	84 (57.5%)	49 (33.8%)	13 (8.9%)	0 (0%)	0 (0%)
Urban	96 (56.7%)	58 (34.1%)	10 (5.9%)	2 (1.2%)	2 (1.2%)
Arts	48 (55.2%)	33 (37.9%)	5 (5.7%)	0 (0%)	1 (1.1%)
Commerce	16 (55.2%)	10 (34.5%)	2 (6.9%)	0 (0%)	1 (3.4%)
Science	93 (58.8%)	48 (30.45)	14 (8.8%)	2 (1.3%)	0 (0%)
Undeclared	24 (55.8%)	16 (37.2%)	2 (4.7%)	0 (0%)	0 (0%)

Fifty seven students said that they eat vegetables most frequently, 55 students said that they eat vegetables second most frequently, and 45 students said that they eat vegetables third most frequently. Sandwiches came second, with 47 students saying that they eat sandwiches most frequently. Wheat products were the third choice, with 45 students saying that they eat wheat products most frequently. Fried foods were the fourth choice that students chose most often; with 41 students saying that they eat fried foods most frequently. See Table 10 for the coded count of students ranking of what they eat most often.

**Table 10: Coded count of students' first through fifth choices of what they eat most often**

Coded Food	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
Beverage	3	5	9	7	11
Wheat Products	45	46	37	37	27
Desserts	2	1	15	16	22
Eggs and Dairy	9	12	12	13	9
Fried Foods	41	47	43	35	24
Fruit	21	8	17	21	17
Meat	22	21	27	26	15
Non-responsive	19	26	34	63	106
Pasta	18	25	24	16	13
Rice and Stir fry	27	21	13	8	15
Sandwiches	47	41	22	17	9
Soup	6	7	16	9	13
Vegetables	57	55	45	49	36

**Table 11: Coded what students wished the dining halls served more of.**

Count of 10 A Coded	Total
10 A Coded	Total
bread and wheat products	13
desserts	5
eggs and dairy	6
ethnic foods	7
fruit	49
healthy foods	40
meat	87
non-responsive	40
pasta	23
sandwiches	6
soup	1
vegetarian options	14
veggies	26
Grand Total	317

**Table 12: Coded what students wished the dining halls served less of.**

Count of 10 B Coded	Total
10 B Coded	Total
bread and wheat products	1
desserts	4
fried foods	136
fruit	1
meat	56
non-responsive	66
pasta	13
rice and stir fry	20
sandwiches	2
saucers	1
soup	4
vegetarian options	2
veggies	11
Grand Total	317

Eighty seven students wished that the dining halls served more meat. 49 students said that they wished the dining halls served more fresh fruit. 40 students said that they wished the dining halls served more healthy foods. See Table 11 for coded student responses for what they wished the dining halls served more of.

One hundred thirty six students wished the dining halls served less fried foods. 56 wished they served less meat. 20 wished the dining halls served less rice and stir-fries. See Table 12 for coded student responses of what they wished the dining halls served less of.

One hundred eighty seven students (59.0%) said that they would consciously choose locally grown food if it was made available to them in the dining halls, 14 (4.4%) said that they would not consciously chose locally grown food, and 84 (26.5%) said that they did not know if they would choose



locally grown food. The trend for urban and rural students follows this pattern (See Table 13). Since  $\chi^2_{df=2} = 5.99$  at the 5% significance level, and the obtained  $\chi^2_{df=2} = 1.65$  is less than this, the hypothesis that choosing local food if available in the dining halls is dependent on whether students are from rural or urban areas can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students follows the same pattern as the total population (See Table 13). Since  $\chi^2_{df=6} = 12.59$  at the 5% significance level, and the obtained  $\chi^2_{df=6} = 5.53$  is less than this, the hypothesis that students who would consciously choose locally grown food is dependent on whether students are arts, commerce, science, or undeclared students can be rejected at the 95% confidence level.

**Table 13: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students that would consciously choose locally grown food if it was made available in the dining halls.**

	Yes	No	Don't Know
Total	187 (59.0%)	14 (4.4%)	84 (26.5%)
Rural	85 (58.2%)	17 (11.6%)	43 (29.5%)
Urban	102 (60.0%)	26 (15.3%)	41 (24.1%)
Arts	59 (67.8%)	8 (9.2%)	20 (22.9%)
Commerce	16 (55.17%)	7 (24.1%)	6 (20.7%)
Science	90 (56.9%)	22 (13.9%)	45 (28.5%)
Undeclared	22 (51.2%)	7 (16.3%)	13 (30.2%)

One hundred sixty one (50.8%) students said that they would not be willing to pay anymore for their meal plan if it guaranteed 50% of locally grown food, 105 (33.1%) said that they would be willing to pay from \$1 to \$50 more, 32 (10.1%) said that they would be willing to pay from \$51 to \$100 more, 6 (1.9%) said that they would be willing to pay from \$101 to \$200 more, and 10 (3.2%) said that they would be willing to pay more then \$200 more for their meal plans. The trend for urban and rural students follows this pattern (See Table 14). Since  $\chi^2_{df=4} = 9.49$  at the 5% significance level, and the obtained  $\chi^2_{df=4} = 3.59$  is less than this, the hypothesis that the extra amount a student is willing to pay for a guarantee that 50% of the food is locally grown is dependent on whether students are rural or urban can be rejected at the 95% confidence level. The trend for Arts, Commerce, Science, and Undeclared students follows this pattern (See Table 14). Since  $\chi^2_{df=12} = 22.36$  at the 5% significance level, and the obtained  $\chi^2_{df=12} = .33$  is less than this, the hypothesis that the extra money students are willing to pay for a 50% guarantee of locally grown food is dependent on whether students are arts, commerce, science, or undeclared students can be rejected at the 95% confidence level.

**Table 14: The number and percentage of Total, Rural vs. Urban, and Arts vs. Commerce vs. Science vs. Undeclared students and how much more they are willing to pay for a guarantee that 50% of the food served in the dining halls is local.**

	\$0	\$1 to \$50	\$51 to \$100	\$101 to \$200	Over \$200
Total	161 (50.8%)	105 (33.1%)	32 (10.1%)	6 (1.9%)	10 (3.2%)
Rural	80 (54.8%)	45 (30.8%)	14 (9.6%)	1 (.68%)	4 (2.7%)
Urban	80 (47.1%)	60 (35.3%)	18 (10.6%)	5 (2.9%)	6 (3.5%)
Arts	34 (39.1%)	36 (41.3%)	11 (12.6%)	2 (2.3%)	4 (4.6%)
Commerce	16 (55.2%)	9 (31%)	1 (3.4%)	1 (3.4%)	2 (6.8%)
Science	81 (51.3%)	50 (31.6%)	18 (11.4%)	3 (1.9%)	4 (2.5%)
Undeclared	30 (69.7%)	10 (23.3%)	2 (4.7%)	0 (0%)	0 (0%)

## **5.2. Aramark Interview Results**

The interview with Derrick Hines, Food Service Director for Dalhousie University took place on March 7<sup>th</sup> at 09:00 in Mr. Hines office. Carmen Lishman and Josée-Ann Cloutier interviewed and videotaped Mr. Hines for thirty minutes with his permission. The following information was transcribed from the videotape, and represents with great accuracy the chosen words of Mr. Hines.

### **Background on Aramark**

Aramark is the singular campus dining hall food service provider. Aramark also provides food in kiosks across campus in certain areas.

### **Food Suppliers**

“Sysco is the one stop shop”. Sysco is also a multinational company based out of United States. Aramark and Sysco hold a national contract within Canada. The food purchasing is headquartered in Toronto and is outsourced to warehouses across Canada. Halifax has a warehouse in Bayers Lake.

Aramark and Sysco hold a national contract that follows tight federal regulations—this defines the decisions made surrounding food suppliers. They must meet guidelines around proper storage, temperatures, and transportation that must fit into a tight purchasing schedule. Purchasing decisions are based on time conveniences that prove to be a challenge when purchasing from smaller scale local farmers.

### **Barriers to providing local food in residences**

The biggest challenge is the farmer. The issue is that most farmers are too small to meet the guidelines and regulations set out by Aramark, Sysco and the Federal Government. Reliability also becomes an issue where Aramark’s number one priority is in maintaining the health regulations where inspections must be adhered. For instance some food require storage within certain temperatures, produce must be washed and unbruised.

They must sign off on sensitivity, health issues and adhere to the health regulations of Aramark as a corporation and to those set out by the governments. They also have exclusive national contracts with large companies such as Heinz who supplies the ketchup. They would not supply local ketchup because of brand recognition (this falls under food politics and the advertising issues around food). People recognize Heinz over a local brand might feel like they can better trust the brand with which they are familiar.

## **Student Opinion**

When asked how heavy student opinion is weighed, Mr. Hines mentioned that they have an on-line survey for students to express their menu preferences. In addition an international student survey is conducted by outside firms to rate Aramark's performance.

When asked about ethical food choices and how Aramark responds to questions and concerns in this area, he mentioned that student's have asked for organic fair trade coffee. Aramark has their own program that is similar to fair trade where they give an amount back to the farmer's. However, he says that the quality of fair trade does not measure up to standards of most other coffees on campus in terms of taste.

### **5.2.1. Economics: Canmac Economic Ltd Nova Scotia Input Output Economic Model©**

- There are 1720 students in the residences.
- They spend 2 million a year on food.
- Students are provided with 3 meals a day, 7 days a week.
- It costs Aramark \$3.74 to produce each meal.

The data collected from this research was input into the Canmac Economic Ltd Nova Scotia Input Output Economic Model to determine how an increase from 25% to 50% locally grown food being served in the Dalhousie University residence dining halls would affect the Nova Scotia economy. Currently, the quarter of the food that Aramark purchases from local farmers directly generates \$1.17 million for the Nova Scotia economy. If Aramark was to purchase another 25% of their food from Nova Scotia farmers, then there would be a direct increase of \$1.17 million to the Nova Scotia economy and the indirect and induced effect would increase output in the Nova Scotia economy by \$1.63 million, for a grand total of \$2.81 million per year (See Table 15). If Aramark was to increase their purchasing of Nova Scotia food by 25% then an estimated 205 jobs will be created in the agricultural sector, an estimated additional 26 jobs will be created in total (See Table 16). The direct increase in wages to labour is estimated to be \$321,000 in the agricultural sector, the indirect and induced wages to labour is estimated to be \$544,000 in total (See Table 17). The increase in GDP for Nova Scotia directly from agricultural sector is estimated to be \$544,000 per year, and the indirect and induced increase to GDP for Nova Scotia is estimated to be \$893,000 if Aramark were to increase their purchasing of Nova Scotia food by 25% (See Table 18). It is estimated that Federal Government revenue will increase by \$133,000, Provincial Government revenues will increase by an estimated \$126,000, and Municipal Government revenues will increase by an estimated \$8,660 (See Table 19). The estimated total for the increase in all government revenues is \$268,000.

**Table 15: The estimated direct, indirect and induced effect that a 25% increase in the purchasing of locally grown foods by Aramark would have on the Nova Scotia Economy.**

Output by Industry

Project: Regional Food - Aramark 25% Increase in Bioregional Food Simulation

NAICS code	NAICS Sector	Direct Output (in \$1000)	Induced and Indirect Output (in \$1000)	Total Output (in \$1000)
111-112	111-112 Farms	\$855.58	\$111.29	\$966.86
113, 1153	113, 1153 Logging and Forestry and Related Services	\$0.00	\$14.28	\$14.28
114, 1150	114, 1150 Fishing and Trapping and Related Services	\$0.00	\$7.56	\$7.56
21	21 Mining and oil and gas extraction	\$0.00	\$17.71	\$17.71
311	311 Food manufacturing	\$0.00	\$124.56	\$124.56
3117	3117 Seafood product preparation and packaging	\$0.00	\$14.77	\$14.77
3121	3121 Beverage manufacturing	\$0.00	\$3.61	\$3.61
3122	3122 Tobacco manufacturing	\$0.00	\$0.14	\$0.14
3261	3261 Plastic product manufacturing	\$0.00	\$0.39	\$0.39
3262	3262 Rubber product manufacturing	\$0.00	\$1.88	\$1.88
313	313 Textile mills	\$0.00	\$2.47	\$2.47
314	314 Textile product mills	\$0.00	\$1.71	\$1.71
315	315 Clothing manufacturing	\$0.00	\$1.50	\$1.50
316	316 Leather and allied product manufacturing	\$0.00	\$0.01	\$0.01
321	321 Wood product manufacturing	\$0.00	\$2.22	\$2.22
322	322 Paper manufacturing	\$0.00	\$11.56	\$11.56
323	323 Printing and related support activities	\$0.00	\$6.35	\$6.35
324	324 Petroleum and coal products manufacturing	\$0.00	\$37.06	\$37.06
325	325 Chemical manufacturing	\$0.00	\$1.94	\$1.94
327	327 Non-metallic mineral product manufacturing	\$0.00	\$3.65	\$3.65
331	331 Primary metal manufacturing	\$0.00	\$0.94	\$0.94
332	332 Fabricated metal product manufacturing	\$0.00	\$2.84	\$2.84
333	333 Machinery manufacturing	\$0.00	\$1.38	\$1.38
334, 335	334, 335 Electrical equipment, appliance, component and Computer and electronic product manufacturing	\$0.00	\$2.36	\$2.36
336	336 Transportation equipment manufacturing	\$0.00	\$11.77	\$11.77
337	337 Furniture and related product manufacturing	\$0.00	\$0.73	\$0.73
339	339 Miscellaneous manufacturing	\$0.00	\$0.73	\$0.73
23	23 Construction	\$0.00	\$24.43	\$24.43
48-49	48-49 Transportation and warehousing	\$0.00	\$41.44	\$41.44
22, 51	22, 51 Utilities and Communication	\$0.00	\$74.30	\$74.30
41	41 Wholesale trade	\$0.00	\$58.78	\$58.78
44-45	44-45 Retail trade	\$0.00	\$79.09	\$79.09
52, 53	52, 53 Finance, Insurance & Real Estate Industries	\$0.00	\$204.25	\$204.25
54, 55, 56	54, 55, 56 Business Service Industries	\$0.00	\$22.41	\$22.41
61	61 Educational services	\$0.00	\$0.30	\$0.30
62	62 Health care and social assistance	\$0.00	\$13.07	\$13.07
72	72 Accommodation and food services	\$0.00	\$29.85	\$29.85
71, 81, 91	71, 81, 91 Other Service Industries	\$0.00	\$29.20	\$29.20
D1	Operating, Office Cafeteria & Laboratory Supplies	\$0.00	\$67.55	\$67.55
D2	Travel & Entertainment, Advertising & Promotion	\$0.00	\$24.08	\$24.08
D3	Transportation Margins	\$0.00	\$22.45	\$22.45
D4	Non Profit Institutions Serving Households	\$0.00	\$13.15	\$13.15
D5	Households	\$321.63	\$544.38	\$866.00
<b>Total</b>		<b>\$1,177.20</b>	<b>\$1,634.14</b>	<b>\$2,811.35</b>

**Table 16: The estimated direct, indirect, and induced increase in employment with a 25% increase in the purchasing of locally grown Nova Scotia food.**

Employment by Industry

Project: Regional Food - Aramark 25% Increase in Bioregional Food Simulation

NAICS code	NAICS Sector	Direct Employment (in person years)	Induced and Indirect Employment (in person years)	Total Employment (in person years)
111-112	111-112 Farms	205.90	16.91	222.81
113, 1153	113, 1153 Logging and Forestry and Related Services	0.00	0.22	0.22
114, 1150	114, 1150 Fishing and Trapping and Related Services	0.00	0.11	0.11
21	21 Mining and oil and gas extraction	0.00	0.09	0.09
311	311 Food manufacturing	0.00	0.61	0.61
3117	3117 Seafood product preparation and packaging	0.00	0.10	0.10
3121	3121 Beverage manufacturing	0.00	0.01	0.01
3122	3122 Tobacco manufacturing	0.00	0.00	0.00
3261	3261 Plastic product manufacturing	0.00	0.00	0.00
3262	3262 Rubber product manufacturing	0.00	0.01	0.01
313	313 Textile mills	0.00	0.03	0.03
314	314 Textile product mills	0.00	0.00	0.00
315	315 Clothing manufacturing	0.00	0.02	0.02
316	316 Leather and allied product manufacturing	0.00	0.00	0.00
321	321 Wood product manufacturing	0.00	0.03	0.03
322	322 Paper manufacturing	0.00	0.05	0.05
323	323 Printing and related support activities	0.00	0.11	0.11
324	324 Petroleum and coal products manufacturing	0.00	0.01	0.01
325	325 Chemical manufacturing	0.00	0.01	0.01
327	327 Non-metallic mineral product manufacturing	0.00	0.02	0.02
331	331 Primary metal manufacturing	0.00	0.02	0.02
332	332 Fabricated metal product manufacturing	0.00	0.02	0.02
333	333 Machinery manufacturing	0.00	0.00	0.00
334, 335	334, 335 Electrical equipment, appliance, component and Computer and electro	0.00	0.03	0.03
336	336 Transportation equipment manufacturing	0.00	0.05	0.05
337	337 Furniture and related product manufacturing	0.00	0.00	0.00
339	339 Miscellaneous manufacturing	0.00	0.01	0.01
23	23 Construction	0.00	0.23	0.23
48-49	48-49 Transportation and warehousing	0.00	0.52	0.52
22, 51	22, 51 Utilities and Communication	0.00	0.60	0.60
41	41 Wholesale trade	0.00	0.71	0.71
44-45	44-45 Retail trade	0.00	2.44	2.44
52, 53	52, 53 Finance, Insurance & Real Estate Industries	0.00	0.84	0.84
54, 55, 56	54, 55, 56 Business Service Industries	0.00	0.43	0.43
61	61 Educational services	0.00	0.00	0.00
62	62 Health care and social assistance	0.00	0.17	0.17
72	72 Accommodation and food services	0.00	0.88	0.88
71, 81, 91	71, 81, 91 Other Service Industries	0.00	1.26	1.26
D1	Operating, Office Cafeteria & Laboratory Supplies	0.00	0.00	0.00
D2	Travel & Entertainment, Advertising & Promotion	0.00	0.00	0.00
D3	Transportation Margins	0.00	0.00	0.00
D4	Non Profit Institutions Serving Households	0.00	0.00	0.00
D5	Households	0.00	0.00	0.00
<b>Total</b>		<b>205.90</b>	<b>26.58</b>	<b>232.48</b>

**Table 17: The estimated increase in wages to labour from a 25% increase in the purchasing of locally grown food by Aramark.**

Labour Income by Industry

Project: Regional Food - Aramark 25% Increase in Bioregional Food Simulation

NAICS code	NAICS Sector	Direct Labour Income (in \$1000)	Induced and Indirect Labour Income (in \$1000)	Total Labour Income (in \$1000)
111-112	111-112 Farms	\$321.63	\$264.16	\$585.79
113, 1153	113, 1153 Logging and Forestry and Related Services	\$0.00	\$3.97	\$3.97
114, 1150	114, 1150 Fishing and Trapping and Related Services	\$0.00	\$3.49	\$3.49
21	21 Mining and oil and gas extraction	\$0.00	\$5.51	\$5.51
311	311 Food manufacturing	\$0.00	\$24.90	\$24.90
3117	3117 Seafood product preparation and packaging	\$0.00	\$2.98	\$2.98
3121	3121 Beverage manufacturing	\$0.00	\$0.71	\$0.71
3122	3122 Tobacco manufacturing	\$0.00	\$0.14	\$0.14
3261	3261 Plastic product manufacturing	\$0.00	\$0.10	\$0.10
3262	3262 Rubber product manufacturing	\$0.00	\$0.79	\$0.79
313	313 Textile mills	\$0.00	\$0.72	\$0.72
314	314 Textile product mills	\$0.00	\$0.57	\$0.57
315	315 Clothing manufacturing	\$0.00	\$0.56	\$0.56
316	316 Leather and allied product manufacturing	\$0.00	\$0.00	\$0.00
321	321 Wood product manufacturing	\$0.00	\$0.60	\$0.60
322	322 Paper manufacturing	\$0.00	\$2.76	\$2.76
323	323 Printing and related support activities	\$0.00	\$2.80	\$2.80
324	324 Petroleum and coal products manufacturing	\$0.00	\$0.71	\$0.71
325	325 Chemical manufacturing	\$0.00	\$0.41	\$0.41
327	327 Non-metallic mineral product manufacturing	\$0.00	\$0.94	\$0.94
331	331 Primary metal manufacturing	\$0.00	\$0.86	\$0.86
332	332 Fabricated metal product manufacturing	\$0.00	\$1.06	\$1.06
333	333 Machinery manufacturing	\$0.00	\$0.71	\$0.71
334, 335	334, 335 Electrical equipment, appliance, component and Computer and electro	\$0.00	\$0.75	\$0.75
336	336 Transportation equipment manufacturing	\$0.00	\$2.90	\$2.90
337	337 Furniture and related product manufacturing	\$0.00	\$0.21	\$0.21
339	339 Miscellaneous manufacturing	\$0.00	\$0.27	\$0.27
23	23 Construction	\$0.00	\$8.96	\$8.96
48-49	48-49 Transportation and warehousing	\$0.00	\$15.84	\$15.84
22, 51	22, 51 Utilities and Communication	\$0.00	\$22.79	\$22.79
41	41 Wholesale trade	\$0.00	\$24.89	\$24.89
44-45	44-45 Retail trade	\$0.00	\$40.44	\$40.44
52, 53	52, 53 Finance, Insurance & Real Estate Industries	\$0.00	\$51.59	\$51.59
54, 55, 56	54, 55, 56 Business Service Industries	\$0.00	\$13.03	\$13.03
61	61 Educational services	\$0.00	\$0.11	\$0.11
62	62 Health care and social assistance	\$0.00	\$10.63	\$10.63
72	72 Accommodation and food services	\$0.00	\$12.59	\$12.59
71, 81, 91	71, 81, 91 Other Service Industries	\$0.00	\$12.25	\$12.25
D1	Operating, Office Cafeteria & Laboratory Supplies	\$0.00	\$0.00	\$0.00
D2	Travel & Entertainment, Advertising & Promotion	\$0.00	\$0.00	\$0.00
D3	Transportation Margins	\$0.00	\$0.00	\$0.00
D4	Non Profit Institutions Serving Households	\$0.00	\$7.67	\$7.67
D5	Households	\$0.00	\$0.00	\$0.00
<b>Total</b>		<b>\$321.63</b>	<b>\$544.38</b>	<b>\$866.00</b>

**Table 18: The estimated increase in GDP due to a 25% increase in locally grown food purchased by Aramark.**

Gross Domestic Product by Industry

Project: Regional Food - Aramark 25% Increase in Bioregional Food Simulation

NAICS code	NAICS Sector	Direct GDP (in \$1000)	Induced and Indirect (in \$1000)		Total GDP (in \$1000)
			(in GDP	\$1000)	
111-112	111-112 Farms	\$544.42		\$447.14	\$991.56
113, 1153	113, 1153 Logging and Forestry and Related Services	\$0.00		\$6.09	\$6.09
114, 1150	114, 1150 Fishing and Trapping and Related Services	\$0.00		\$4.07	\$4.07
21	21 Mining and oil and gas extraction	\$0.00		\$9.51	\$9.51
311	311 Food manufacturing	\$0.00		\$42.30	\$42.30
3117	3117 Seafood product preparation and packaging	\$0.00		\$2.79	\$2.79
3121	3121 Beverage manufacturing	\$0.00		\$1.05	\$1.05
3122	3122 Tobacco manufacturing	\$0.00		\$0.14	\$0.14
3261	3261 Plastic product manufacturing	\$0.00		\$0.17	\$0.17
3262	3262 Rubber product manufacturing	\$0.00		\$0.81	\$0.81
313	313 Textile mills	\$0.00		\$1.05	\$1.05
314	314 Textile product mills	\$0.00		\$0.45	\$0.45
315	315 Clothing manufacturing	\$0.00		\$0.83	\$0.83
316	316 Leather and allied product manufacturing	\$0.00		\$0.01	\$0.01
321	321 Wood product manufacturing	\$0.00		\$0.75	\$0.75
322	322 Paper manufacturing	\$0.00		\$4.63	\$4.63
323	323 Printing and related support activities	\$0.00		\$3.64	\$3.64
324	324 Petroleum and coal products manufacturing	\$0.00		\$0.65	\$0.65
325	325 Chemical manufacturing	\$0.00		\$0.60	\$0.60
327	327 Non-metallic mineral product manufacturing	\$0.00		\$1.39	\$1.39
331	331 Primary metal manufacturing	\$0.00		\$0.32	\$0.32
332	332 Fabricated metal product manufacturing	\$0.00		\$1.09	\$1.09
333	333 Machinery manufacturing	\$0.00		\$0.73	\$0.73
334, 335	334, 335 Electrical equipment, appliance, component and Computer and electro	\$0.00		\$1.12	\$1.12
336	336 Transportation equipment manufacturing	\$0.00		\$4.12	\$4.12
337	337 Furniture and related product manufacturing	\$0.00		\$0.33	\$0.33
339	339 Miscellaneous manufacturing	\$0.00		\$0.44	\$0.44
23	23 Construction	\$0.00		\$9.67	\$9.67
48-49	48-49 Transportation and warehousing	\$0.00		\$21.82	\$21.82
22, 51	22, 51 Utilities and Communication	\$0.00		\$50.80	\$50.80
41	41 Wholesale trade	\$0.00		\$33.95	\$33.95
44-45	44-45 Retail trade	\$0.00		\$47.87	\$47.87
52, 53	52, 53 Finance, Insurance & Real Estate Industries	\$0.00		\$129.01	\$129.01
54, 55, 56	54, 55, 56 Business Service Industries	\$0.00		\$14.68	\$14.68
61	61 Educational services	\$0.00		\$0.14	\$0.14
62	62 Health care and social assistance	\$0.00		\$10.65	\$10.65
72	72 Accommodation and food services	\$0.00		\$15.36	\$15.36
71, 81, 91	71, 81, 91 Other Service Industries	\$0.00		\$23.67	\$23.67
D1	Operating, Office Cafeteria & Laboratory Supplies	\$0.00		\$0.00	\$0.00
D2	Travel & Entertainment, Advertising & Promotion	\$0.00		\$0.00	\$0.00
D3	Transportation Margins	\$0.00		\$0.00	\$0.00
D4	Non Profit Institutions Serving Households	\$0.00		\$0.00	\$0.00
D5	Households	\$0.00		\$0.00	\$0.00
<b>Total</b>		<b>\$544.42</b>		<b>\$893.85</b>	<b>\$1,438.27</b>

**Table 19: The estimated increase in fiscal revenues if Aramark increase their purchasing of locally grown food by 25%.**

Total Fiscal Revenues by Industry (all in \$1000)

Project: Regional Food - Aramark 25% Increase in Bioregional Food Simulation

NAICS code	NAICS Sector	Federal Revenues	Provincial Revenues	Municipal Revenues	Total
111-112	111-112 Farms	\$90.31	\$85.28	\$5.86	\$181.45
113, 1153	113, 1153 Logging and Forrestry and Related Services	\$0.61	\$0.58	\$0.04	\$1.23
114, 1150	114, 1150 Fishing and Trapping and Related Services	\$0.54	\$0.51	\$0.03	\$1.08
21	21 Mining and oil and gas extraction	\$0.85	\$0.80	\$0.06	\$1.71
311	311 Food manufacturing	\$3.84	\$3.62	\$0.25	\$7.71
3117	3117 Seafood product preparation and packaging	\$0.46	\$0.43	\$0.03	\$0.92
3121	3121 Beverage manufacturing	\$0.11	\$0.10	\$0.01	\$0.22
3122	3122 Tobacco manufacturing	\$0.02	\$0.02	\$0.00	\$0.04
3261	3261 Plastic product manufacturing	\$0.02	\$0.01	\$0.00	\$0.03
3262	3262 Rubber product manufacturing	\$0.12	\$0.11	\$0.01	\$0.24
313	313 Textile mills	\$0.11	\$0.10	\$0.01	\$0.22
314	314 Textile product mills	\$0.09	\$0.08	\$0.01	\$0.18
315	315 Clothing manufacturing	\$0.09	\$0.08	\$0.01	\$0.17
316	316 Leather and allied product manufacturing	\$0.00	\$0.00	\$0.00	\$0.00
321	321 Wood product manufacturing	\$0.09	\$0.09	\$0.01	\$0.19
322	322 Paper manufacturing	\$0.43	\$0.40	\$0.03	\$0.86
323	323 Printing and related support activities	\$0.43	\$0.41	\$0.03	\$0.87
324	324 Petroleum and coal products manufacturing	\$0.11	\$0.10	\$0.01	\$0.22
325	325 Chemical manufacturing	\$0.06	\$0.06	\$0.00	\$0.13
327	327 Non-metallic mineral product manufacturing	\$0.15	\$0.14	\$0.01	\$0.29
331	331 Primary metal manufacturing	\$0.13	\$0.13	\$0.01	\$0.27
332	332 Fabricated metal product manufacturing	\$0.16	\$0.15	\$0.01	\$0.33
333	333 Machinery manufacturing	\$0.11	\$0.10	\$0.01	\$0.22
334, 335	334, 335 Electrical equipment, appliance, component and Computer and electrc	\$0.12	\$0.11	\$0.01	\$0.23
336	336 Transportation equipment manufacturing	\$0.45	\$0.42	\$0.03	\$0.90
337	337 Furniture and related product manufacturing	\$0.03	\$0.03	\$0.00	\$0.06
339	339 Miscellaneous manufacturing	\$0.04	\$0.04	\$0.00	\$0.08
23	23 Construction	\$1.38	\$1.30	\$0.09	\$2.77
48-49	48-49 Transportation and warehousing	\$2.44	\$2.31	\$0.16	\$4.91
22, 51	22, 51 Utilities and Communication	\$3.51	\$3.32	\$0.23	\$7.06
41	41 Wholesale trade	\$3.84	\$3.62	\$0.25	\$7.71
44-45	44-45 Retail trade	\$6.23	\$5.89	\$0.40	\$12.53
52, 53	52, 53 Finance, Insurance & Real Estate Industries	\$7.95	\$7.51	\$0.52	\$15.98
54, 55, 56	54, 55, 56 Business Service Industries	\$2.01	\$1.90	\$0.13	\$4.04
61	61 Educational services	\$0.02	\$0.02	\$0.00	\$0.03
62	62 Health care and social assistance	\$1.64	\$1.55	\$0.11	\$3.29
72	72 Accommodation and food services	\$1.94	\$1.83	\$0.13	\$3.90
71, 81, 91	71, 81, 91 Other Service Industries	\$1.89	\$1.78	\$0.12	\$3.80
D1	Operating, Office Cafeteria & Laboratory Supplies	\$0.00	\$0.00	\$0.00	\$0.00
D2	Travel & Entertainment, Advertising & Promotion	\$0.00	\$0.00	\$0.00	\$0.00
D3	Transportation Margins	\$0.00	\$0.00	\$0.00	\$0.00
D4	Non Profit Institutions Serving Households	\$1.18	\$1.12	\$0.08	\$2.38
D5	Households	\$0.00	\$0.00	\$0.00	\$0.00
	<b>Total</b>	<b>\$133.51</b>	<b>\$126.08</b>	<b>\$8.66</b>	<b>\$268.25</b>

### Local Food on Menus

- Potatoes are from PEI, Cavendish and McCain Company.
- Depending on the season, they will buy Nova Scotia apples from large scale farms in the Annapolis valley.
- All the dairy including milk is from Nova Scotia.
- These items are also sourced through Sysco who signs the liability forms.
- The seasonal cycles play a big role when purchasing fresh produce. Mr. Hines mentioned that they will sometimes receive unripe bananas.

Overall, Mr. Hines says the whole thing is an intensive process.



### **5.3. Farmer Interview Results**

#### **Sellwood Green**

Norbert Kungl is an organic farmer. Mr. Kungl graduated from the Agricultural College in Germany and has since been an organic farmer for 20 years. Sellwood Green is one of the larger producers of organic produce in Nova Scotia. They distribute their produce every Saturday at the local farmer's market, in addition to supplying restaurants and retail outlets such as the Grainery Food Co-op and Great Ocean Natural Foods. His motivation for producing locally organic food is for environmental health reasons.

Mr. Kungl has approached universities by offering local organic meal options. However, there are many barriers at the institutional level in implementing such a proposition. In last year's interview, Mr. Kungl indicated that he feels the problem is "associated with management not being aware of the benefits of going organic and what little increase it would have in costs."<sup>75</sup> He also indicated issues around insurance, liability and convenience. The barriers are covered in more detail in this report but to reiterate food suppliers at the institutional level require a "one stop shop" where they will spend the least amount of time dealing with food supply. He also mentions the economic monopolies and politics on food supply.

As a result, SeaSpray Atlantic Cooperative has been formed to address these issues. The co-operative is a means to distribute locally grown foods at the institutional level, by pooling resources together they are able to offer the mass quantities and variety of food that institutions require. Thus far, SeaSpray includes 20 farmers from Nova Scotia, PEI and Newfoundland

It is not possible for one farmer alone to supply at the institutional level. However, an arrangement such as SeaSpray Atlantic would be feasible. The co-operative conducted a survey of their capacity. The results indicated that thousands of pounds of meat can be supplied along with "tons and tons of basic vegetable".

As a start for the study, Mr. Kungl suggested to find out the costs per plate of food and to then break it down per item and compare it with his prices. Through his research, he found that the cost is not significantly greater and in certain instances could be less depending on the season.

In order for food suppliers to consider change, consumers need to show an interest. He does not think that Dalhousie is ready to take it on because it is too big. SeaSpray is currently working with Mount Saint Vincent University because they are smaller and less conservative and more importantly, they have shown an interest.

#### **Ted Hutton and the Hutton Family Farms**

The interview with Ted Hutton was based on prior knowledge from last year's study. The study indicated that Mr. Hutton is not interested in expanding but is in fact cutting down his current production. He is not interested in supplying at the institutional level for personal reasons such as having time to spend with his family and for his own health. He is happy keeping his distribution at the farmer's market.

Mr. Hutton's priority in promoting local food (aside from benefiting himself) is the social justice issues surrounding food production in other countries. He did not get into detail about this except that there are issues around labour. He suggests that one of the many barriers for farmers to supply on a larger scale is the cost associated with it. Some provincial governments do not support local farmers while others, like Quebec, subsidize local farmers. He also states that availability is an issue, which depends on demand and the season where this harsh climate does not support the argument to go local at the institutional level.

---

<sup>75</sup> Briggs, L., Climenhaga, R., McKenna, M. Murray, L. & Robinson, J. (2004) "TO EAT OR NOT TO EAT: The problem of unsustainable food practices at Dalhousie University." ENVS 2502: Environmental Problem Solving II: the Campus as a Living Laboratory. Halifax, Nova Scotia: Dalhousie University. [http://www.dal.ca/~envsci/envs3502\\_projects\\_2004/Food.doc](http://www.dal.ca/~envsci/envs3502_projects_2004/Food.doc) Accessed on: February 10, 2005.

## **Colville Farms**

Colville Farms is a certified organic farm run by Paul and Ruth Colville. They have been farming in the Annapolis Valley since 1972. Mr. Colville left New York City and his job as a stock broker and has since been trying to make a living at farming for over 20 years.

He spoke passionately about food security and how the “big trucks keep on driving by all the farms here in Nova Scotia because they don’t fit into the distribution system.” He also mentions, “the Annapolis Valley has been feeding people for 400 years. 15-20 years from now, farmers will have little access to the local market.” Farmer’s are now caught in a bind where they are barely able to support their families. The supermarkets such as Sobey’s and the Superstore don’t allow local farmer’s to sell and farmer’s markets do not provide enough exposure to allow them to sell a large enough quantity to support themselves and their families.

The institutions, he mentions have the power to make decisions that would benefit the well-being of people since institutions are an extension of the taxpayer. Whereas, it is difficult to convince corporate giants like Sobey’s that they have a responsibility. Decisions on food purchasing are made by committees within the institutions. He mentions that it will require reorganization but on a smaller scale. He emphasizes to “start small” because it is a long process. However, he also emphasizes that every decision counts and makes a difference.

The greatest barrier is not the issue itself but that there is not enough education around the issue. Priorities are not being made that would help farmer’s sustain. He suggests that food distribution companies like Sysco can set a policy where 50% will be purchased from local farmers. The barrier is that no one is making the decision and no one will on his or her own.

## **6. Discussion and Conclusions**

The problem being addressed in this report is that there is a lack of bioregional food on Dalhousie University campus, specifically in the residence dining halls. The purposes of this research were to gain an understanding of bioregional foods, assess the current bioregional practices within Dalhousie residence dining halls, assess students’ awareness and opinion surrounding bioregional foods, and evaluate the feasibility of implementing bioregional practices in these dining halls, and to determine local farmer’s willingness and ability to provide locally grown food at the institutional level.

### **6.1. Significant Findings**

#### **Student Survey**

Based on the student surveys, it can be determined that most students believe that local products has benefits in terms of health, the environment and the local economy, and that they would support such an endeavour in their relative dining hall, however, they would not pay extra for this service. Students want healthier choices and a greater variety of food in the dining halls and the choices they currently select and currently desire can be accommodated by local suppliers. It is also interesting to note that the origin of the food is often a lost notion, and many students noted that the greatest limitation to this was the fact they live in residence and did not have any power over purchasing policies.

#### **Aramark Interview**

Based on the interview with Mr. Hines, it can be determined that several food groups are produced bioregionally according to the operational definition stated above. The information provided by Mr. Hines shows the difficulty in moving food directly from farm to dining hall when large companies, like Aramark are involved. Aramark requires all food to meet federal health inspections as a general company policy. Most small farmers are not capable of paying to be federally certified, leaving only large factory farms available to supply Aramark. In addition, the circuit of food production, processing, distribution, manufacturing and consumption is essentially the only way Aramark can provide food to students, given their regulatory and efficiency limitations. A direct relationship between Aramark and

farmer is therefore made impossible by the top-down function of the company. Maintaining efficiency and health standards in the food industry is not something to discount, as any professional in the field will agree, so it is important to remember that farmer co-operatives may be the best way to achieve this while using food that is produced locally and sustainably.

Based on the Canmac Economics Ltd. Nova Scotia Input Output Economic Model, increasing the purchasing of food grown in Nova Scotia would have a significant positive impact on the Nova Scotia economy. Information given by Aramark was input into the Canmac Economics Ltd Nova Scotia Input Output Model that simulates the effects on the Nova Scotia economy from an increase from 25% to 50% in locally grown food being served in the Dalhousie University residence dining halls. It is estimated that if an additional 25% of food was purchased from the Nova Scotia agricultural sector the estimated increase in total output in the Nova Scotia economy is \$2.81 million per year for a direct increase of \$1.17 million per year. An estimated 232 jobs would be created in total, with 205 of them being created directly in the agricultural sector. The estimated direct increase of wages to labour is \$321,000 in the agricultural sector and an estimated increase of \$544,000 in total labour income. The estimated direct increase in Nova Scotia GDP is \$544,000 (in the agriculture sector), while the estimated total increase in Nova Scotia GDP is \$893,000. The Nova Scotia Provincial Government annual revenue is estimated to increase by \$126, 000, while the Federal Government's revenues are estimated to increase by \$133,000. As these numbers suggest an increase of 25% in purchasing of Nova Scotia grown food by Aramark has a large positive effect on the Nova Scotia economy. Based on this model it is clear that purchasing local food does, in fact, support the local economy.

### **Farmer Interviews**

Based on the interviews with several local farmers, it can be determined that there is an interest in supplying local universities with low impact and/or certified organic options in residence dining halls. The limitations to these farms supplying Dalhousie University are the inability of a single supplier to suffice Dalhousie's needs, the expense of federal certification and the economic limitations: often the choices supplied by these farmers are more expensive. The extra expense is largely the true cost of food being charged as opposed to the under-production prices from the large scale subsidized farms found in supermarkets. Local low impact options would be significantly less expensive if it were subsidized by the Nova Scotian government. Quebec, for instance is shown to be a good example that supports local farmers. As a result, the local economy is retained within the Province because the government has placed control measures over the agricultural market. However, until Nova Scotia supports their farmers, local low impact options may be more expensive.

In order to address the issues of supply and convenient distribution methods that are sought by the institutions, SeaSpray Atlantic is a coalition of 20 farmers from the Maritime Provinces who have gathered their resources and organized themselves to meet the demands at the institutional level. Farmer cooperatives have proven to be successful, as highlighted in case studies where campuses have adopted bioregional food by means of creating the relationship with farmer cooperatives. As it stands, SeaSpray Atlantic is presently negotiating with Mount St-Vincent University in supplying local and organic food options since there is enough interest within the University.

### **6.2. Considerations in Light of Previous Research**

The results of the survey demonstrate that there is a potential demand for bioregional initiatives in residence dining halls. The University of Northern Iowa, University of Wisconsin-Madison, Yale University and the University of Washington have all demonstrated that such initiatives are feasible, even if only on a small scale. However, this research does correlate with previous research done at Dalhousie University: that economics is the driving factor in food purchasing decisions and that purchasing from local organic and low impact farmers is more expensive than the suppliers Aramark currently has.

### 6.3. Recommendations for Future Research

In light of the findings of this research project, it can be recommended that future research endeavours include:

- Starting an educational and awareness campaign about the food in residence dining halls, food purchasing practices and their implications as well as feasible alternatives so that students can make an informed choice about their food choices. This could expand beyond the dining halls so that when students move out of residence and start to purchase their own groceries, they can apply this information to those situations.
- Investigating the feasibility of developing a subsidy program for small scale farms so they can enjoy the benefits of federal certification.
- Investigating the feasibility of incorporating a single low impact or organic produce item in residence dining halls, for example apples, and then assessing the success of such an endeavour.
- Investigating farms that supply Sysco in order assess their sustainability, quality, and environmental and socio-economic impact.
- Investigating in more detail additional Maritime farmers as to what type of products they can supply and how much of it.
- Doing a life cycle analysis of the food currently in residence dining halls to assess the travel time, implications and true expense of a single meal at Dalhousie University and use this in comparison to a life cycle analysis of a low organic meal option.

### 6.4. Conclusions

Four major conclusions can be drawn from this research:

- **Research is not without bias.** The bias of the researchers being environmentally conscientious students was evident in the perception and diagnosis of the problem. The researchers defined bioregional as food grown within the Maritime Provinces and made the assumption that this would correlate to local organic and low impact goods. While it can be concluded that the majority of Aramark's food is bioregional (subject to seasonal limitation) this does not necessarily mean that it is low impact farming.
- **Bioregional may not necessitate low impact.** Despite the fact that Aramark felt they were being bioregional, implications of food and its sources go far beyond that of origin. It is still high impact; large scale farming that is serviced to Aramark through a middle man (Sysco). Had the researchers in fact defined bioregional as local- organic and local low impact, perhaps the findings would be different.
- **Often Economics and politics will define the solutions.** The implementation of small co-operative farmers is not socially and economically feasible at this time, due to pricing, regulations and comparison of quantity supplied as opposed to quantity demanded.
- **Education is important.** Further education of all actors involved is needed. While the implementation of bioregional foods may not be feasible, an increased awareness among the consumers would be beneficial. This way if they decide to not choose bioregional foods, they can understand the implications of doing so and if they do choose bioregional foods, they can understand the benefits of doing so.

## 6.5. Acknowledgments

The researchers would like to thank Tarah Wright and Judith Lipp for their guidance and support, all the student participants, and Norbert Kungl, Ted Hutton, Paul Colville and Derrick Hines for their interviews. They would also like to thank Brian Wile for all the statistical analysis assistance, and Mike Smith for assistance with the documentary.

## BIBLIOGRAPHY

- Briggs, L., Climenhaga, R., McKenna, M. Murray, L. & Robinson, J. (2004) "TO EAT OR NOT TO EAT: The problem of unsustainable food practices at Dalhousie University." ENVS 3502: Environmental Problem Solving II: the Campus as a Living Laboratory. Halifax, Nova Scotia: Dalhousie University. [http://www.dal.ca/~envsci/envs3502\\_projects\\_2004/Food.doc](http://www.dal.ca/~envsci/envs3502_projects_2004/Food.doc) Accessed on: February 10, 2005.
- Frazao, E. (1996). The American Diet: A Costly Health Problem Food Review, Vol.19, No.1: 2-6
- Hansen, Erica. The Yale Herald. October 11, 2002 Vol. XXXIV, No. 6 (accessed March 2, 2005) <http://www.yaleherald.com/article.php?Article=1156>
- Heller, M. & Keoleian, G.A. (2003) Assessing the sustainability of the US food system: a life cycle perspective. Agricultural Systems: 76 pp. 1007–104
- Pretty, J. (1998) The Living Land - Agriculture, Food and Community Regeneration in Rural Communities. London: Earthscan Publications Ltd. pg 81
- Kneen, B. (1995) From Land to Mouth: Understanding the Food System. Toronto: NC\_Press Limited
- Lappe, F. & Lappe, A. (2004) "Diet for a Smaller Planet: Real Sources of Abundances." Feeding the Future: From Fat to Famine: How to Solve the World's Food Crises. Ed. Heitzman and Solomon. Toronto: Anansi
- Miller, A. (1999) Environmental Problem Solving- Psychosocial Barriers to Adaptive Change. New York: Springer
- Nestle. M. (2002) Food Politics: How the Food Industry Influences Nutrition and Health., University of California Press, 2120 Berkeley Way, Berkeley, CA
- Palys, T. (2003) Research Decisions; Quantitative and Qualitative Perspectives 3<sup>rd</sup> ed. Scarborough, Ontario: Thomson/Nelson
- Peters, J. (1997) Community Food Systems: Working Toward a Sustainable Future. Journal of the American Dietetic Association, Vol.97, No.9: 955-956
- Sanger, K. and L. Zenz. Farm to Cafeteria Connections: Marketing Opportunities for Small Farms in Washington State. Washington State Department of Agriculture. Nov 2003. pp. 59-60
- Wheeler, D. & Thomson, J. (2004) Brand Barons and the Business of Food. Feeding the Future: From Fat to Famine: How to Solve the World's Food Crises. Ed. Heitzman and Solomon. Toronto: Anansi
- Wright, T. (2004) Environmental Problem Solving I. Halifax: Dalhousie University.

- Wright, T. (2005) Environmental Problem Solving II: The Campus as a Living Laboratory. Halifax: Dalhousie University.
- Aramark. [www.aramark.ca](http://www.aramark.ca). Retrieved January 25<sup>th</sup>, 2005.
- Canadian Centre for Occupational Health and Safety, <http://www.ccohs.ca/> accessed Jan 30<sup>th</sup>, 2005
- Dalhousie University (2005) Dalhousie University Academic Time Table  
[https://admbws.ucis.dal.ca:8000/PROD/fysktime.P\\_DisplaySchedule?s\\_term=200510,200520&s\\_subj=ENVS&format=1](https://admbws.ucis.dal.ca:8000/PROD/fysktime.P_DisplaySchedule?s_term=200510,200520&s_subj=ENVS&format=1) accessed: March 23, 2005
- Dalhousie University Senate. (1990). Environmental Policy for Dalhousie University. Halifax: Dalhousie University. <http://www.senate.dal.ca/listall.cfm?policy=PEPD U&type=P>. accessed January 31<sup>st</sup>, 2005.
- Dalhousie University Senate. (1991) Senate Policy: Halifax Declaration. Halifax: Dalhousie University. <http://www.senate.dal.ca/policy.cfm?policy=PHD&type=P>. Accessed January 31, 2005
- Dalhousie University Senate. (1999) Senate Policy: Talloires Declaration. Halifax: Dalhousie University. <http://www.senate.dal.ca/policy.cfm?policy=PTD&type=P>. Accessed March 31, 2005.
- Halifax Farmers' Market. (2005) Farmers' Market Association of Nova Scotia.  
<http://www.nsfarmersmarkets.ca/halifax/main.htm> accessed: February 27, 2005
- Merriam Webster's Collegiate Dictionary, 10<sup>th</sup> edition (1996)
- Sustainable Table. <http://www.sustainabletable.org/issues/buylocal/>. Accessed Feb 1<sup>st</sup>, 2005.
- Statistics Canada, 2001 Census of Agriculture: <http://www.statcan.ca/> Accessed Saturday Jan 29<sup>th</sup>, 2005.
- University of Pennsylvania. (1993) Institute for Bioregional Studies. Accessed January 22<sup>nd</sup>, 2005
- University of Northern Iowa Local Food Project. Centre for Energy and Environmental Education.  
<http://www.uni.edu/ceee/foodproject/#c>. accessed: January 31, 2005
- University of Wisconsin- Madison (2004) The College Food Project: UW-Madison Case Study  
<http://www.cias.wisc.edu/uwmad.php> Last updated: 2004 by the College of Agricultural and Life Sciences at UW-Madison

## Appendix A: Talloires Declaration

### TALLOIRES DECLARATION, 1990

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources.

Local, regional, and global air and water pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of "green house" gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations. These environmental changes are caused by inequitable and unsustainable production and consumption patterns that aggravate poverty in many regions of the world.

We believe that urgent actions are needed to address these fundamental problems and reverse the trends. Stabilization of human population, adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration are crucial elements in creating an equitable and sustainable future for all humankind in harmony with nature.

Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge.

We, therefore, agree to take the following actions:

1. Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
2. Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward global sustainability.
3. Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate, and have the awareness and understanding to be ecologically responsible citizens.
4. Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.
5. Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
6. Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.
7. Convene university faculty and administrators with environmental practitioners to develop curricula, research initiatives, operations systems, and outreach activities to support an environmentally sustainable future.
8. Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development.
9. Work with national and international organizations to promote a worldwide university effort toward a sustainable future.
10. Establish a Secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.

## Appendix B: Halifax Declaration

### HALIFAX DECLARATION, 1991

Human demands upon the planet are now of a volume and kind that, unless changed substantially, threaten the future well-being of all living species. Universities are entrusted with a major responsibility to help societies shape their present and future development policies and actions into the sustainable and equitable forms necessary for an environmentally secure and civilized world.

As the international community marshals its endeavours for a sustainable future, focused upon the United Nations Conference on Environment and Development in Brazil in 1992, universities in all countries are increasingly examining their own roles and responsibilities. At Talloires, France in October, 1990, a conference of university presidents from every continent, held under the auspices of Tufts University of the United States, issued a declaration of environmental commitment that has attracted the support of more than 100 universities from dozens of countries. At Halifax, Canada, in December 1991, the specific challenge of environmentally sustainable development was addressed by the presidents of universities from Brazil, Canada, Indonesia, Zimbabwe and elsewhere, as well as by the senior representatives of the International Association of Universities, the United Nations University and the Association of Universities and Colleges of Canada.

The Halifax meeting added its voice to those many others worldwide that are deeply concerned about the continuing widespread degradation of the Earth's environment, about the pervasive influence of poverty on the process, and about the unsustainable environmental practices now so widespread. The meeting expressed the belief that solutions to these problems can only be effective to the extent that the mutual vulnerability of all societies, in the South and in the North, is recognized, and the energies and skills of people everywhere be employed in a positive, cooperative fashion. Because the educational, research and public service roles of universities enable them to be competent, effective contributors to the major attitudinal and policy changes necessary for a sustainable future, the Halifax meeting invited the dedication of all universities to the following actions:

1. To ensure that the voice of the university be clear and uncompromising in its ongoing commitment to the principle and practice of sustainable development within the university, and at the local, national and global levels.
2. To utilize the intellectual resources of the university to encourage a better understanding on the part of society of the inter-related physical, biological and social dangers facing the planet Earth.
3. To emphasize the ethical obligation of the present generation to overcome those current malpractices of resource utilization and those widespread circumstances of intolerable human disparity which lie at the root of environmental unsustainability.
4. To enhance the capacity of the university to teach and practise sustainable development principles, to increase environmental literacy, and to enhance the understanding of environmental ethics among faculty, students, and the public at large.
5. To cooperate with one another and with all segments of society in the pursuit of practical capacity-building and policy measures to achieve the effective revision and reversal of those current practices which contribute to environmental degradation, to South-North disparities and to inter-generational inequity.
6. To employ all channels open to the university to communicate these undertakings to UNCED, to governments and to the public at large.

Done at Dalhousie University, Halifax, Canada, the 11th day of December, 1991.



## **Appendix C: Dalhousie University's Environmental Policy**

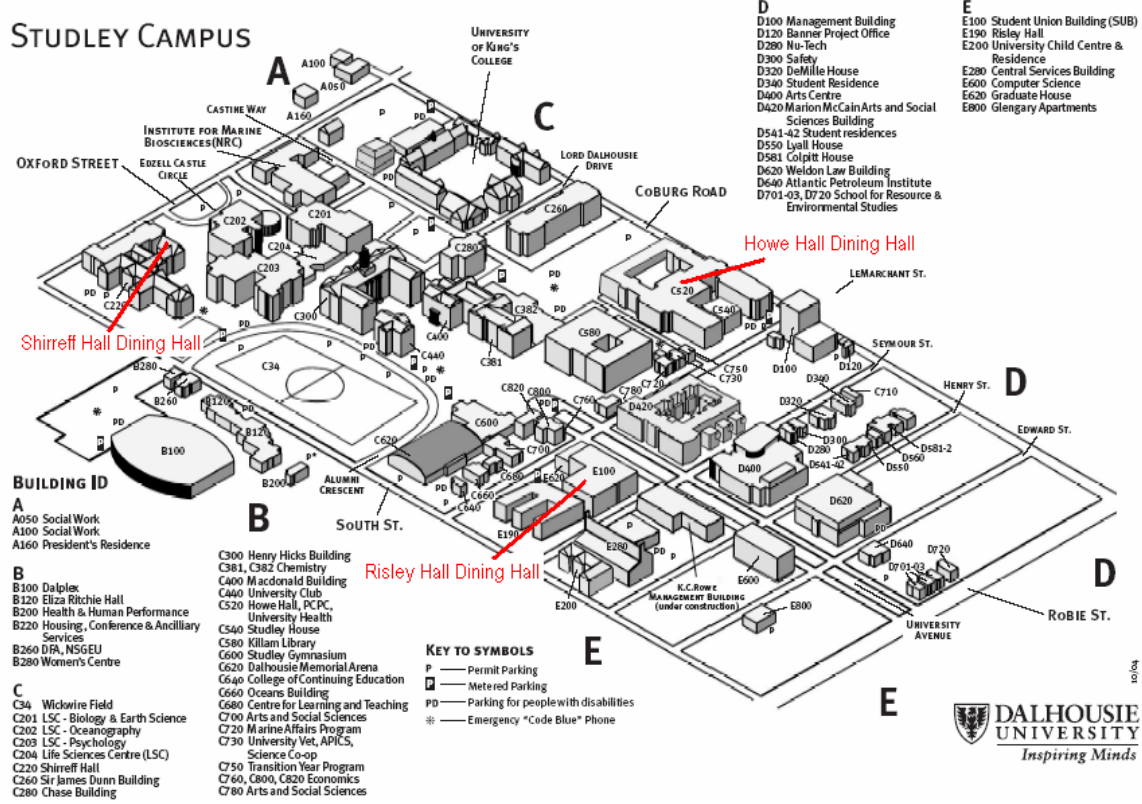
### **ENVIRONMENTAL POLICY FOR DALHOUSIE UNIVERSITY**

As adopted by Senate November 9, 1990

Dalhousie University is an educational institution, an employer, a corporate citizen and a property owner. Dalhousie University recognizes that, in all of these contexts, it has a special responsibility to conduct its activities in an environmentally sound manner. Dalhousie University realizes that its diverse academic and operational activities have significant impacts on the environment. Some of these impacts are positive, and these are to be encouraged. Some negative impacts may be unavoidable, but others can be eliminated or substantially mitigated. Dalhousie University believes it should take a leadership role in regard to environmental management. It is the policy of Dalhousie University to strive to conduct its activities in ways that do not cause unacceptable degradation of the environment. The cornerstone of Dalhousie's environmental policies are as follows:

1. Dalhousie University will offer academic choices that will ensure that its students, employees, and the broader community will have opportunities to become well versed concerning environmental issues and solutions.
2. Dalhousie University will strive to conduct its research activities in ways that are environmentally appropriate. Dalhousie University will also encourage its faculty and associates to conduct research that investigates the causes and mitigation of environmental degradation, as well as social, economic and industrial pathways towards sustainable development.
3. Dalhousie University will strive to manage its buildings and grounds in ways that are environmentally appropriate.
4. Dalhousie University will strive to achieve a working and educational environment that is acceptable in terms of health.
5. Dalhousie University will plan an exemplary role by ensuring that its corporate operations become as environmentally sound as allowed by technology, economics and common sense.
6. It is the expectation that all persons and units affiliated with Dalhousie University will strive towards the attainment of these environmental objectives.

# Appendix D: Map of Dalhousie University's Studley Campus



## Appendix E: Letter of Intention

Dear Interviewee,

My name is \_\_\_\_\_, and I am a \_\_\_\_\_ year student at Dalhousie University. As part of my Environmental Problems Solving course (ENVS 3502), I am conducting a study to see if it is feasible to have locally grown, organic food on campus.

The purpose of this project is to determine whether there is a student demand for locally grown food in cafeterias, whether there would be enough produce to satisfy that demand, and whether Aramark would be willing to explore the possibility of implementing food options on campus that are local and more sustainable.

During the interview you will be asked to answer a list of questions that relate to the issue of local food in campus cafeterias. The interview will last approximately \_\_ minutes and will be done at your convenience.

Your decision to participate in the interview is strictly voluntary; you may withdraw at any time without providing a reason. The interview session will be video taped to document the study. Only the course instructor and those students collaborating on this project will have access to the tapes. The tapes will be compiled to form a short film that will become widely available. Due to the nature of the information being provided, it may be important to include your name in the report; therefore, anonymity cannot be guaranteed.

The Department of Environmental Programmes and the Dalhousie Ethics Review Board have reviewed this project. If you have any questions or concerns, please feel free to contact myself at \_\_\_\_\_ or the course instructor, Tarah Wright, at 494-3683. If you agree to the interview conditions described above please sign in the space provided on the next page. If wish to obtain a copy of our final report, please write your email address or your mailing address on the back of the form.

We thank you very much for your time and participation.

## **Appendix F: Informed Consent Form**

### **Part I.**

I understand the information explained in the letter and agree to participate in the interview.

\_\_\_\_\_  
Signature of Interviewee

\_\_\_\_\_  
Date

### **Part II.**

I have explained the purpose and procedures of this interview to the participant and have answered any questions and concerns of the participant.

\_\_\_\_\_  
Signature of Researcher

\_\_\_\_\_  
Date

## Appendix G: Student Survey

### Food in Residence Dining Halls: Are Bioregional Practices Important for Dining Hall Services? ENVS 3502: Environmental Problem Solving II Class Project

Please refer to the informed consent forms available from the surveyors.

#### General Information

- 1) What is your major? What year are you in?
  
- 2) Where are you from? Is it rural<sup>76</sup> or urban<sup>77</sup>?

#### Food in General

- 3) How important is what you eat to you?
  - a. Important
  - b. Somewhat important
  - c. Somewhat unimportant
  - d. Unimportant
  
- 4) Please respond to the following statements:
  - a. My personal health is important to me.  
AGREE/ DON'T KNOW/ DISAGREE
  
  - b. Environmental health is important to me  
AGREE/ DON'T KNOW/ DISAGREE
  
  - c. A strong local economy is important to me.  
AGREE/ DON'T KNOW/ DISAGREE
  
- 5) Do you feel that local food choices would promote these values more so than imported food choices?  
YES NO DON'T KNOW
  
- 6) Is where your food is grown important to you? How important?
  - a. Important
  - b. Somewhat important
  - c. Don't know
  - d. Somewhat unimportant
  - e. Unimportant

WHY?

- 7) Please respond to this statement: I know the origin of my food.

---

<sup>76</sup> Population equal to or less than 2000 people in the town/ city centre

<sup>77</sup> Population greater than 2000 people in the town/city centre

These Statistics were derived from Statistics Canada.

- a. Always
- b. Almost always
- c. Sometimes
- d. Never

**Food in Residence**

8) You eat in dining hall:

- a. 16-19 times per week
- b. 11-15 times per week
- c. 6-10 times per week
- d. 1-5 times per week
- e. Never

9) What do you eat most frequently in the dining hall?

- 1.
- 2.
- 3.
- 4.
- 5.

10) What do you wish the dining hall served:

- a. More of?
  
  
- b. Less of?

11) Would you consciously choose local food options if they were made available in your dining hall?

YES      NO      DON'T KNOW

12) Please respond to this statement: I would pay \_\_\_\_\_ more for my meal plan if it guaranteed that 50% of the produce purchased was local.

- a. \$0
- b. \$1-\$50
- c. \$51-100
- d. \$101- 200
- e. more than \$200

13) Do you think that it important to have some locally grown food available in residence dining halls? Why or why not?

## Appendix H: Aramark Interview Questions

1. What factors does your company use in food buying decisions?
2. Do you ever use local food?
  - a. What are the policies surrounding it?
  - b. Are there requirements to incorporate a certain amount local food?
3. Have you ever set up contracts with local farmers?
4. Where is your food produced? processed?
5. Are there clauses in your existing agreements that would influence or restrict your ability to use local food from other sources?
6. Could you see your company using local food? NOTE!
7. Is student satisfaction a factor in your food purchasing decisions? If so, how do you assess it? What have the trends been in cafeterias at Dalhousie?
8. Do you see any benefits or advantages to local food

The following are number we need for producing a theoretical input-output economic model with an experimental program we have access to from Canmac Economics©. You may supply us with them at your convenience, perhaps by email at a later date.

9. What is your current expenditure on food for Dalhousie cafeterias?
  - a. How much are you currently spending on [get list from farmers of items that they could produce enough of to sufficiently supply the university cafeterias]?
  - b. How much of these items are required for one day; month; year (ex. how many lbs of potatoes/day?)
10. How many meals are served per day?
11. What is the average cost of a meal?

Thank you for your time.

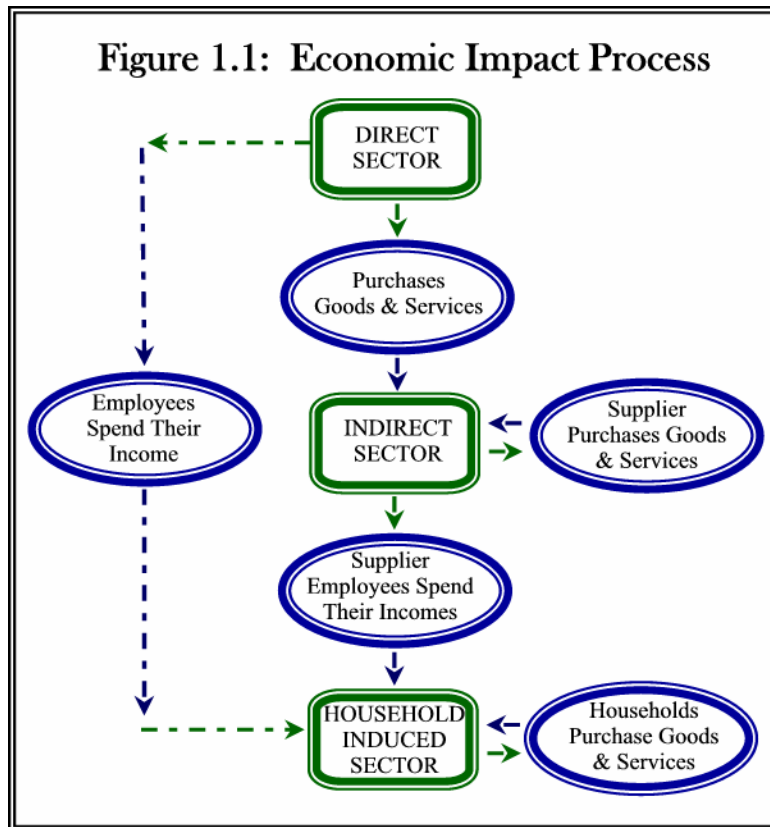
## **Appendix I: Farmer Interview Questions**

1. How long have you been a farmer?
2. In your opinion, what are the benefits to buying and eating local food?
3. Have you ever attempted to wholesale your produce or market it at the institutional level?
4. What are the biggest hurdles in such a process? Or what might you imagine they would be?
5. What are the crops of which you produce the most?
6. Would you be able to supply a demand like Dalhousie's with enough food?  
Need to find out the supply that Dalhousie requires and add it to this question
7. What are some crops that you would be able to provide in mass quantity?  
Again, here must define how much 'mass quantity' would be.
8. Could you provide us with some sample prices?



## Appendix J: Canmac Economic Ltd. Nova Scotia Input Output Economic Model Overview

The economic impact process resembles the following schematic.



The approach to measuring the total direct, indirect and induced effects associated with the project is to conduct simulations with the Nova Scotia Input-Output (I/O) model. I/O or inter-industry analysis was developed by the economist Wassily Leontief during the 1930s. It is an empirical representation of a general theory of production based on the notion of economic interdependence. Leontief's original I/O table showed how each sector of the economy depends upon every other sector (including households), either to supply its inputs or to purchase its outputs. This is still the basic characteristic of all I/O models.

In an I/O model each industry in the local economy depends, in principle, on every other industry for the supply of intermediate goods. The ultimate goal of the I/O model is to trace the transmission of demand through the economy. The model's operations are somewhat restricted. Firstly, industry production functions are linear and inputs must be used in fixed proportions. In other words, economies and diseconomies of scale are not permitted, as they would require intricate calculation of non-linear functions representing complex and rapidly changing relationships between industries. Secondly, a generally strict assumption of I/O models is that prices and wages are fixed and the supply of both intermediate goods and final goods is unlimited. Thirdly, I/O models take a long time to construct, and may reflect economic relationships that are slightly out-of-date when they are applied.

Today, I/O tables are available for about forty national economies and the number of regional and local I/O tables is growing rapidly. The Regional Science Institute can provide I/O tables for every American state and many smaller areas. The development of computers and

efficient methods of calculation permits a great deal of industrial disaggregation, providing considerable details on the economic transactions within an economy, and offering some understanding of how demand moves throughout the economy. This is often simulated as a “shock”, say a 10% or 20% increase or drop in demand.

The I/O model describes impacts in terms of direct, indirect and induced effects. In this impact exercise, the direct effect is defined as the total value of output for the specified industry. The indirect effect is defined as the total value of output from other industries in the regional economy that supply the sectors. This supply includes ‘suppliers of suppliers’ that is the demand for goods and services includes both direct suppliers to the direct sector, and to their suppliers. The induced effect refers to the additional industry output that arises as households spend the incomes they earn by working in the direct sector, or in supplying inputs to the direct sector (that is, at the direct and indirect stages), or other goods and services in the economy. The total economic value is measured as the sum of the direct, indirect and induced income effects.

The economic impacts for this study have been estimated using an Input-Output model based on Statistics Canada Input-Output tables. The model is based on 1996 data at the small level aggregation of 43 industries. Expenditures are entered into the model which extract retail, wholesale and transportation margins and reallocate them to the retail trade, wholesale trade and transportation industries.

Import coefficients are applied to the remaining dollar amounts to leak out of the province expenditures which are NOT produced in the province. For example, most expenditure spent on parts for machinery and equipment would be leaked out because most mechanical parts used in vehicles throughout the province are NOT produced in Nova Scotia. Conversely, most expenditures on services such as the mechanics repairing a vehicle would stay in the province as this is a commodity (repair service) performed in the province.

The dollars remaining in the province are allocated to the industries which produce the commodities (the information about which industry produce which commodities is provided by the Output tables). In turn, those industries will consume commodities used to produce the commodities (this information about what commodities are used by each industry in their production process is provided by the Input tables) consumed by the consumer (for example, a fishermen buying fuel for his boat to catch salmon purchased at the food store by shoppers), etc.

The model continues to iterate until there is no money left in the model (imports, taxes and savings are all leakages which will eventually reduce to zero the amount of money spent initially by the direct industry). Then the model stops and the total impacts by industry are added up from all iterations. The statistic generated by the Input-Output model is called the Gross Production (sales) by industry. Employment by industry is derived by extracting the salary component of each industry (from the Gross Production) and dividing it by the average annual salary for that given industry.

The Gross Domestic Product (GDP) is calculated by extracting from the Gross Production by industry the so-called "Primary input" components: indirect taxes (for example GST), subsidies, salaries and benefits for employees, profits and depreciation for the private sector. Extraction of both the salaries to calculate employment and the GDP components is based on coefficients contained in the Use (or Input) tables provided by Statistics Canada.

The tax revenues are calculated by using taxation coefficients derived from Statistics Canada publications about federal and provincial tax revenues by province. The taxation coefficients are applied to salaries, profits and are used to allocate indirect taxes between both senior levels of governments.

## *Glossary of Terms*

### **Gross Domestic Product (GDP)**

The measure of economic activity in an economy, in this case the Nova Scotia economy. GDP measured on an expenditure basis is expressed as:

$$\text{GDP} = \text{C} + \text{G} + \text{I} - \text{X} - \text{M}$$

where:

- C = Personal consumption (expenditure) of goods and services.
- G = Government expenditures on goods and services.
- I = Investment in capital, machinery equipment and inventories.
- X = Exports of goods and services.
- M = Imports of goods and services.

GDP is also measured on an income basis and consists of :

- labour income
- corporate profits before taxes
- interest and investment income
- net farm income
- unincorporated business income
- inventory valuation adjustment
- indirect taxes less subsidies
- capital consumption allowance

Gross domestic product of an industry is the value added by labour and capital in transforming inputs purchased from other producers into outputs.

### **Direct Contribution**

All 'first round' economic activities which contribute to GDP. These can vary from investment in a new or expanded facility to wages paid to employees directly involved in production.

### **Indirect Contributions**

All 'subsequent rounds' of economic activities which contribute to GDP. These activities are not directly associated with the production activity but are a result of direct production activities. These indirect contributions also include 'induced contributions' which measure the economic activity associated with the respending of wages paid in the direct, indirect, and to a lesser extent earlier rounds of induced activity.

### **Input-Output (I-O)**

The input-output model measures the wide economic impact of a direct economic event by the known inter-industry dependency in the given economy. Different sectors of an economy depend on other sectors of the economy to supply its inputs or purchase its output to varying degrees. The imbalance in this supply/demand relationship is made up by imports (supply) and exports (demand).

The input-output model measures total economic activity defined as direct + indirect + induced activities. For an explanation on direct, indirect and induced activity see preceding GDP definition.

### **Input-Output Tables**

These tables list the supply (make) of commodities by industry, demand (use) of commodities by industry and final demand (personal expenditure, government expenditure, investment, exports and imports). In an input-output model which is closed with respect to households (includes induced impacts) households are treated as an industry.

These tables along with employment and GDP by Industry in the input-output system are used to produce impact multipliers for output, employment, household income and GDP.

### **Input-Output Multipliers**

Relate the indirect and induced impact by industry to the direct increase or reduction of the output of a given industry. The sum of all industries indirect and induced impacts plus the direct industry impact equals the total impact.

Multipliers are produced for output, income, GDP, and employment.

**'Output Multipliers'** relate the indirect and induced output impact to the change in direct output.

**'Income-generated Multipliers'** relate the change in household income to the change in output.

**'Income-based Multipliers'** relate the indirect and induced household income to the direct income associated with the change in output.

**'Employment Multipliers (output basis)'** relate the additional employment per output change.

**'Employment-based Multipliers'** relate the indirect and induced employment to the direct employment associated with the change in output.

**'Value added/GDP Multipliers'**. These multipliers (coefficients) relate to the additional GDP per output change.