

**EXPLORING WAYS TO LIGHTEN THE ECOLOGICAL FOOTPRINT OF BLUE CHIP
COOKIES**

Sophia Baker-French, Elissa Smith, Chung Sang Wong, Rhonda Lee Van Oerle,

Jacqueline Thornhill, Ravinder Samra

University of British Columbia

AGSC 450

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Group 28:
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ABSTRACT

The UBC Food System Project is a community based action research project involving the collaboration of several stakeholders from the UBC AMS community. The main goal of the project is to improve the sustainability of the UBC food system. Our team's task for scenario three was to research and implement methods to incorporate ecologically lighter footprint food items into the menu of the AMS Food and Beverage Department outlet Blue Chip Cookies. Our group reviewed literature from various academic databases and previous AGSC 450 reports. We also communicated with project stakeholders from Blue Chip Cookies and the AMS Food and Beverage Department through interviews and email. A survey was administered to Blue Chip's consumers in order to assess attitudes toward supporting the incorporation of ecologically friendly products such as local, organic and animal-free food items at Blue Chip. Results showed significant support for incorporating local food and certified organic food at Blue Chip. Our group generated several proposals including the addition of the local BC Fruit Bar and animal-free Ginger-Molasses Cookie at Blue Chip. Cost analyses showed that both products can be successfully incorporated into Blue Chip's menu. Nutritional analyses were done to show that both items displayed adequate nutritional quality. Our group also designed a marketing strategy to increase awareness of ecological friendly foods at Blue Chip. Lastly, we included recommendations for future AGSC 450 classes and our fellow collaborators.

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INTRODUCTION

This body of this paper is divided into five main sections; first we introduce the paper by defining the problem, summarizing our vision statement and value assumptions. Secondly, we outline our methodology; thirdly, we illustrate and discuss our results. Next, we make recommendations for three key stakeholders based on our research finding and finally, we conclude the paper.

PROBLEM DEFINITION

Along with the rise of industrialization and globalization, the dramatic expansion of the human population over the last decade has put more pressure on the global ecosystem. We are depleting many natural resources and creating pollutants that are resulting in global warming. Our current patterns of resource consumption and waste production have risen well beyond the bio-capacity of our planet (Wackernagel, 1996), and if they continue unchecked Earth will not be able to support us or our future generations (Redefining Progress, 2007). Therefore, reducing our impact on the global ecosystem, or becoming more sustainable, is undeniably an important path for all to consider in addressing these problems (UBCFSP Scenario, 2008). To this end, the Land & Food System's UBC Food System Project (UBCFSP) was started to help UBC become a model for sustainability.

Over the past seven years, UBC faculties, community stakeholders and AGSC 450 students have collaborated to achieve this goal in many successful initiatives (UBCFSP Scenario, 2008). The task presented to our group this year was to explore ways the AMS Food and Beverage Department can lighten its' ecological footprint (EF) specifically through making recommendations for menu items with less ecological impact (UBCFSP Scenario, 2008). An EF is the estimation of an individual's impact on the ecological system according to one's lifestyle

(Our Ecological Footprint, 2008) using the amount of land required for the production of one's food and the absorption of one's waste as indicators (Our Ecological Footprint, 2008).

Our group decided to focus on the AMS food venue Blue Chip Cookies, which is located on the first floor of the Student Union Building (SUB). Early in the term, we consulted with other groups in our scenario, which resulted in each group working with a different AMS venue. We chose Blue Chip because we felt that little ecological footprinting work had been done at the establishment and many of our group members have had previous café and baking experience.

VISION STATEMENT

Although we identify with all eight of the guiding principles of the UBC Food Systems Project, we felt we should focus on several select points that strongly related to our scenario, including the concepts of sustainably produced food, awareness building and responsibility for the protection of our environment. These concepts guided the direction of our work. We were unable to address other concepts such as the food table as it was not feasible for Blue Chip. We also took this opportunity to emphasize our personal values. Although nutritional content was not the guiding principle of our project, it was always a consideration because we feel that food security is a component of sustainability. If our recommendations were inappropriate or unaffordable our ideas could not be sustained.

In an effort to reduce the EF within the food system of UBC, we endeavor to form a lasting and significant collaborative effort with the stakeholders in the AMS and their food-service outlets to increase the availability of sustainably produced food. To this effect we adamantly adhere to the following priorities in all aspects of our project:

- Our stakeholders, the AMS staff, food outlet managers and consumers, must inform and guide our process and final recommendations and must be given the opportunity to gain awareness from this collaboration.
- We define “sustainably produced foods” to the best of our ability and using the best available research, whether or not this definition includes animal-free and other assumed components.

- We consider economic sustainability, not only in maintaining reasonable costs for the consumer, but ensuring sustainable market forces for the food venue and ingredient producers. This may include consideration of Fair Trade Certified products.
- It is a priority that we consider all aspects of food security, including nutritional value, availability, safety, enjoyment and suitability.

GROUP VALUE ASSUMPTIONS

Our group is comprised of students from various majors within the Faculty of Land and Food Systems. This enables us to view our task with a more complete picture. We share a common vision based on the weak-anthropocentric paradigm. This paradigm views nature as an essential component of human's survival and vice versa (UBCFSP scenario, 2008).

METHODS

We used Community Based Action Research (CBAR) strategies to ground our project. We actively involved representatives of organizations and businesses, fellow researchers, and even the public in aspects of the research process. These partners contributed their expertise to enhancing our understanding of sustainability issues surrounding Blue Chip Cookies and we integrated their knowledge into our recommendations in order to benefit the community.

METHODOLOGY OF COMMUNICATION & INTERVIEWS

Our project began with a group discussion in which we discussed our group values, the problem and possible solutions and their feasibility. We determined that background research needed to be done to help us define the concept of EFs and the factors affecting it and what work other organizations have done. We also began reviewing the work of previous AGSC 450 groups. During this process, we took part in opportunities to hear from AMS and UBC Food and Beverage representatives, including Myriem Steine, Nancy Toogood, and Steve Golob, the chef from Place Vanier Residence. We had further meetings with Nancy Toogood, and multiple meetings with Bev Teh, the manager of Blue Chip. After these meetings we determined a survey

was needed to gauge the demand for an eco-friendly product and how it could be best marketed (more information below). We performed an analysis on the survey results and communicated those results to both Bev and Nancy. We collaborated with them to determine the actual demand for various items, as well as which ideas were more feasible. We decided to make several recommendations with marketing plans including three to Blue Chip, one to the sustainability coordinator and one to future AGSC 450 students. All recommendations involve the stakeholders' suggestions, consider their concerns and ultimately reflect our vision of a lighter EF. We met with stakeholders again, revisited our plans to make our recommendations more feasible, and constructed our recommendations to meet our outlined definition of a lighter EF, the stakeholders' suggestions and concerns and the project parameters.

METHODOLOGY OF RESEARCH

In researching for this project we have employed a variety of sources including online databases, websites, articles, past UBCFSP papers and cookbooks. While we found some information in academic databases such as the *UBC Library*, *EBSCOhost*, *Agricola*, *Nature* and *ScienceDirect*, we found that these sources are lacking in the area of EFs of food. We turned to *Google Scholar* as a secondary online search engine source. These searches were done by using keywords related to the theme of our project: “*UBCFSP*”, “*Ecological footprint calculation*”, “*Carbon footprint*”, “*Environmental impacts*”, “*Ecological capacity*”, “*Sustainable food items*”, “*University dining*”, “*Food dining*” and “*Footprint Labeling*.” We also utilized the hyperlinks of “*Related Article*.” that were found along with these searches. Although we used broad online searches we made sure to select results from legitimate, peer-reviewed sources.

In addition, we reviewed papers from the past UBCFSP projects and our course package to guide our initial direction and project scope. Lastly, the recipes for our recommended bake goods, *Ginger Molasses Cookie* and *BC Fruit Bar*, are adapted from a family source and the cookbook “*Joy of Cooking*” respectively.

After speaking with Bev, we determined in order to justify recommending lighter EF items or menu changes we needed to determine if there was customer demand for such a change and for determining the best marketing strategy (vegan, environmentally friendly, etc.). We wrote an eleven-question survey (see appendix) asking customers about their current buying practices and their preferences for potential items. This survey was reviewed by teaching assistants Liska Richer and Karen Rideout before being administered. As part of the survey we collected information on age, gender and relationship to the university and we had each participant sign the mandatory consent form.

In administering the survey, we went to the Blue Chip outlet and targeted Blue Chip customers. We divided ourselves into five shifts with two people administering the survey per shift. We were at Blue Chip a total of 10 hours on Monday, Tuesday and Wednesday (March 17, 18 & 19, 2008) covering the hours of 8:00 AM until 6:30 PM with the goal of surveying a diverse and random sample of Blue Chip customers. At the end of the period we surveyed 150 customers. We also took note of some of the comments people had about survey questions.

For the data analysis, we tallied all the valid surveys. A member of our group took the survey results to Robert Kozak in the Forestry department for help in interpretation.

RESULTS & DISCUSSION

REVIEW OF PREVIOUS AGSC 450 PROJECTS

Upon receiving our task, we reviewed previous reports related to our scenario in order to determine what had been done to date. Although this is the first year in which our scenario has been implemented, several previous projects have dealt with similar themes. In 2006, group 3 developed a plan to increase UBC farm produce into Bernouilli's Bagels' menu (Group 3, 2006). Since our group also ranked the incorporation of local food as a major indicator in reducing the

EF of Blue Chips, the report from group 3 gave us valuable insight on how to effectively address our scenario. We decided to expand on this recommendation and investigate the feasibility of incorporating more local food items at Blue Chip as one of the main focuses for our project.

WHAT OTHER INSTITUTIONS HAVE DONE

We researched what other institutions have done to lighten the EF of their food venues in order to better understand the range of feasible changes we could suggest in a large organization like the AMS. We found that lighter EF menus are increasingly common in universities and other organizations. The following is a list of schools and organizations that have adopted lighter EF menu items, what they have done and how this applies to the AMS at UBC.

- **Brown University-** Brown's Community Harvest program purchases local and ethical food and includes a public education component (Brown Dining Webpage).
- **Duke University-** Duke incorporates environmental factors into food provider assessments to encourage ecologically friendly food. Duke documented its food system and had made funding available to make dining more green (Duke University Webpage).
- **Harvard University-** Harvard's dining association purchases locally and has seasonal menus to better use local products (Harvard University Webpage).
- **Food For Thought Café- Portland State University-** This café has identified indicators for ethically sourced foods to be: locally and sustainably grown, less packaged, more recycled, more composted, affordable, and provide living wages/working conditions. The café features local, seasonal, organic, sustainable, and fair trade products on its vegetarian menu. The university's dining uses locally and sustainably produced foods (Portland State University Website).
- **Yale University-** Yale's guidelines for determining sustainability are in order of importance: local, organic and fair trade from other regions. Foods have a two or three tier system for

determining their level of sustainability which is considered in purchasing. The food services offer seasonal dishes to better utilize the local fair (Yale University Website).

- **UBC-Place Vanier Residence-** This year Vanier has 40 new recipes featuring local products and they are working with their suppliers to get as much local produce as possible (Steve Golob, guest lecture).
- **Green Table-** This is a local organization that certifies and connects sustainable restaurants with sustainable food suppliers and growers. There is an associated decal that consumers can look for at participating restaurants to help ensure that the restaurant is: composting, recycling, being energy/water efficient, using environmentally friendly supplies, buying local/organic foods, and supporting a like-minded community (Green Table Website).

The AMS has the potential to utilize all these methods to lighten their EF. It is a lofty task to meet the standards of purchasing local/organic food ingredients, encourage food outlets to create seasonal dishes highlighting local produce/products, and help outlets to reduce energy and pollutant use, but through these changes the AMS would be going further than any of the institutions listed above because the AMS is serving students in a public institution. Ecologically friendly changes in menu items are occurring but they are not yet universally accessible as they are occurring in upper class venues: Ivy League schools and the upscale restaurants. We assume this is because buying local and/or organic products cost more (Pollen, 2006). This means the AMS is revolutionary in taking steps to make environmentally friendly products available to all on campus without the substantial private funding these other institutions receive.

DEFINING LIGHTER EF MENU ITEMS

The “AMS Lighter Footprint Strategy” aims to reduce the university campus’s EF. The EF of food is the biologically productive area of land and water ecosystems required to produce all inputs used and to absorb waste generated by the food production and consumption (Wackernagel and Rees, 1996). The production and consumption of food is resource intensive

and has been shown to have large environmental consequences (McMichael, 2005; White, 2000). Ecofootprinting is also an assessment tool by which to gain insight into the environmental impacts of consumer food choices. Based on a review of the literature, we identified five food products that are relevant to Blue Chip Cookies that may be placed within a spectrum of high to low EFs; butter, eggs, flour, processed fruits, and processed vegetables.

Industrially Produced Food Products	Collins and Fairchild, 2007 (in gha/kg)	Gerbens-Leens, 1999 (in m ² /kg)
Butter (local)	0.0115	13.8
Eggs (local)	0.0012	3.5
Flour	0.0007	1.6
Processed Fruits (e.g. apple sauce)	0.0005	0.5
Processed Vegetables (e.g. canned)	0.0005	0.3

Table 1: The EFs of five industrially produced food products

Collins and Fairchild used the unit global hectares per kilogram (gha/kg) to express the EFs of the five food items (2007), whereas Gerbens-Leens used metres squared per kilogram (m²/kg) (1999). These two units are not readily convertible because gha/kg expresses the EF relative to the biocapacity of the world, for example one gha of agricultural land occupies a much smaller physical area than one gha of pasture-land but they both result in the same productivity, whereas m²/kg represents an actual physical area.

Nevertheless, general trends can be extracted from this data even if these two methods of expressing EFs cannot easily be converted: butter is a food product with a very high EF, eggs have a lower EF than butter, and flour, processed fruits and vegetables are on the lower end of the EF spectrum. We can deduce from this data that plant-based food products have a significantly lower EF than animal-based food products and therefore eating lower on the food chain tends to reduce our EF. We assume that flax seed and oats are in this same EF range as flour, i.e. slightly higher EF than processed fruits and vegetables but lower than animal-based products.

To contextualize this data, Collins and Fairchild are writing about the EF of conventional food products in Wales, and Gerbens-Leens are writing about the EF of the same conventional

food products in the Netherlands. We know from Pollans' work (2006) that food is not created equal, and that EF values will differ significantly throughout the world, depending on the methods of production and transportation (Bentley & Barker, 2005).

Pollan argues that assessing the ecological impact of food is very complex (2006). Therefore, in addition to the review of EF literature, our group brainstormed lighter EF constituent parameters, and collaboratively ranked these parameters in order of importance based on our collective knowledge and experience.

The parameters are in order:

1. local/mode of transportation/seasonality
2. animal/plant origin
3. organic/free-range/shade grown
4. processing/packaging
5. healthy *
6. fair-trade *

* Nutritional and economic perspective together with EF analysis can provide a more comprehensive approach from which to ultimately inform policy decisions on sustainable food consumption.

We ranked local above organic because of the added benefit of being able to more effectively influence the sustainability of local agriculture due to proximity and close contact. We ranked both local and animal-product free higher than organic because we feel that organic, in the mainstream sense of the word, has less opportunity to reduce the EF of food items, as discussed in Michael Pollen's Omnivore's Dilemma (2006). If Blue Chip were to switch its ingredients to organic it would most likely be sourcing from large-scale organic producers and therefore the only benefit would accrue from a reduction in the pesticide and herbicide application. Although this reduction is very important we feel that sourcing local and animal-free foods would reduce the EF of Blue Chip Cookies more dramatically.

INTERVIEW RESULTS

Through interviews with our stakeholders, we considered several options for incorporating lighter EF food items at Blue Chip. The initial input received in interviews with

Bev Teh and Nancy Toogood helped our group to decide which options would be most suitable for implementation at Blue Chips. Our group initially decided that creating a new vegan item would be the most successful for lowering Blue Chips EF. However, Bev Teh, the manager of Blue Chip, informed us during our first interview that there was no demand for vegan options, which was later confirmed by our survey, and she advised that it would be more practical to replace existing ingredients with more ecologically friendly ingredients (Bev Teh, personal communication, March 3, 2008). Based on advice from Nancy Toogood we decided to propose switching to organic flour because Bernoulli's Bagels already uses it. We attempted to meet with the AMS purchaser Nick Gregory to better understand the feasibility of this switch and to potentially implement this change but he was away on vacation until the final week of our project. Additionally, we contacted the AMS's Neptune sales representative Kim Babiuk with questions about how the company sources their products but we never heard back from her.

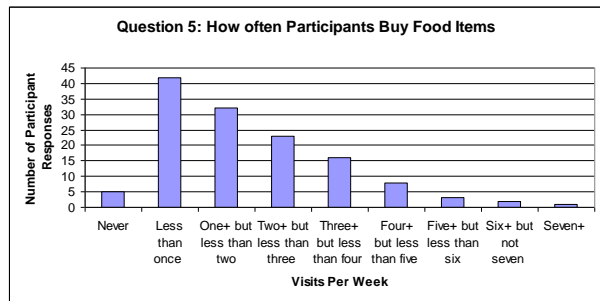
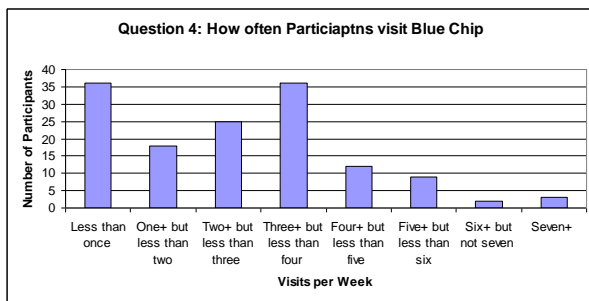
In a later interview with Nancy Toogood, Nancy informed us that there is a demand for vegan food items at AMS food outlets, citing the popularity of The Pendulum Café's vegan banana bread (Nancy Toogood, personal communication, March 20, 2008). Thus, our group decided that a vegan product at Blue Chip may also gain popularity, which brought us to propose the vegan Ginger-Molasses Cookie (see appendix). This idea is based on Bev's idea to add a ginger-spice cookie to the lineup of Blue Chip Cookies (Bev Teh, personal communication, March 3, 2008). After several group discussions and the involvement of our stakeholders, our group decided to propose the addition of another new item to the Blue Chip menu, the BC Bar, a fruit bar made showcasing seasonal local ingredients (see appendix). We felt that these two items would best represent our values in regards to lower EF foods as we ranked the elimination of animal products and the incorporation of local food as our two most important indicators for lowering the EFs of foods. We communicated this to Bev to ensure she was open to this idea.

SURVEY

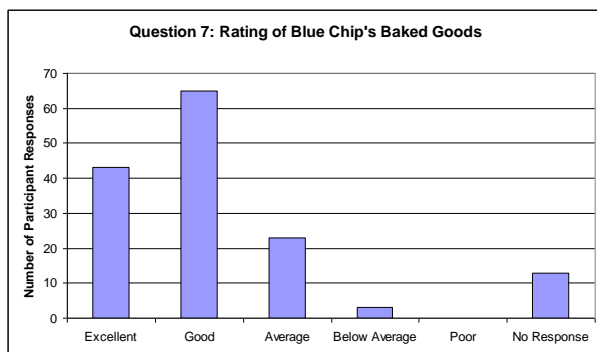
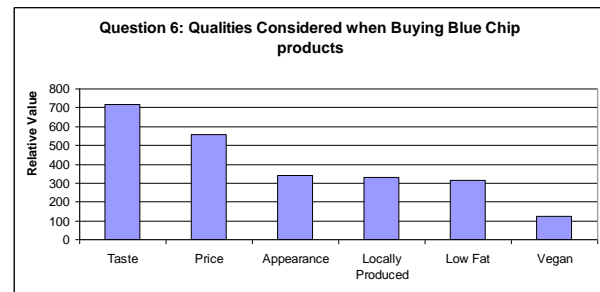
Our survey is written with the purpose of supporting or rejecting the introduction of a vegan or lighter EF menu item at Blue Chip and determining customer support for such an item. We decided to administer this survey as a response to the manager’s belief that there is no demand for vegan items at Blue Chip. This survey is biased by the needs of our project, and the needs, concerns and suggestions of Bev (the Blue Chip manager).

Results

Demographics: 70% of survey participants were undergraduates, 67% were females, and 57% were aged 19-24. The majority of our respondents were regular customers who came to Blue Chip one or more times a week and bought food items fairly regularly as well.

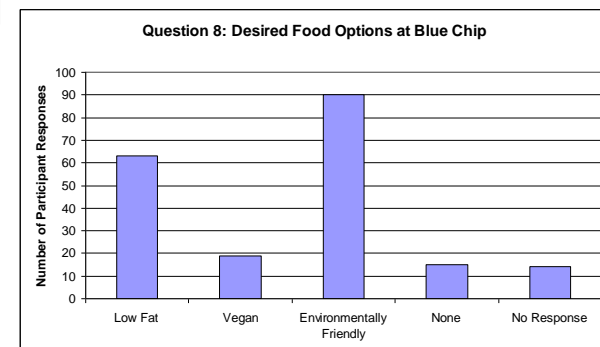


Question 6 suggests that survey participants valued taste and price most. Appearance, locally produced and low fat all ranked closely after that. Vegan was by far the least important quality.

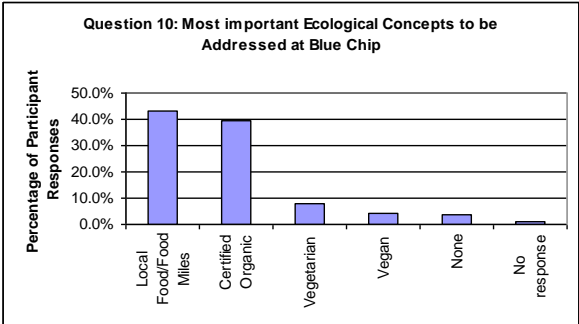


From Question 7 the survey suggests that most of the participants rated Blue Chips baked goods as excellent or good when considering variety and quality.

In Questions 8 and 9, our survey suggests that surveyed customers would like to see more



environmentally friendly and low fat food options at Blue Chip. Of the participants surveyed 81% said they were willing to pay more for an environmentally friendly option with an average response of \$0.33 more per item.



The majority of survey participants said that local food/food miles and certified organic food were the two most important ecological food concepts to address at Blue Chip.

Discussion

In the administration of the survey at Blue Chip we attempted to ask all customers leaving Blue Chip to participate in our survey but often found we were busy with one survey and unable to ask everyone. Additionally, the people who were most willing to fill out the survey were people who were waiting for a drink to be prepared. This might speak to the reason we had so many more female participants than male as Bev told us more females order prepared drinks than male (Bev Personal Communication, March 20, 2008). We do not see this as necessarily biasing our data. However, we are aware that personal bias can come out in face-to-face survey administration in terms of whom a surveyor chooses to interview. All survey administrators agreed that it was much easier to survey people who made eye contact with us or customers who seemed to not be in a hurry. These factors could have skewed our survey results if there were a correlation between the customers’ willingness to answer our survey and one or more of the responses to the survey.

Our data is also biased because we targeted Blue Chip customers but current Blue Chip customers do not represent the potential demand for Blue Chip products, especially new products, campus wide. To obtain a more comprehensive picture of potential demand for potential Blue Chip items we could have surveyed more widely in the Student Union Building (SUB) and could have inquired why people did or did not buy from Blue Chip. We decided against this methodology because survey participants can respond however they want on a survey

but in the end their answers are not a guarantee that they do or will patron Blue Chip if we implement change. By sampling current Blue Chip customers we can be confident that any changes we make will be accepted by the current customer base and will therefore not compromise Blue Chip's popularity.

Finally, our survey may have been biased because it was held during Responsible Consumption Week in the SUB. Booths and information about buying environmentally friendly products surrounded the participants of the survey. This may have influenced people to answer the survey differently than they might have if the survey had been administered in a week without the fair.

In the survey administration, we received comments and questions about several of the survey questions indicating to us that the questions were not clear. We also received inappropriate responses to at least one question, which indicates the participant did not understand or did not read the instructions for the question. The issues are listed below.

Question 6- Eight surveys were not used for this question because of inappropriate answers. Some participants put check marks instead of ranking the choices, while others simply put 1-6 in order, which indicates that they may not have thought about the question. In retrospect we should have structured this question without a ranking scheme.

Question 8- This question should have included an "other" category so that we would have access the full spectrum of answers. As it is we guided people to answer within the categories we are interested in. On one hand this is okay because we are stakeholders in the survey but on the other hand we passed up an opportunity for the public to contribute with their opinion from which creative ideas could potentially have sprung.

Question 9- The wording of "a more environmentally friendly food option" is ambiguous and some participants asked us to define this before they would answer. We left the question ambiguous because we wanted people to define this themselves. In retrospect, we should have included the indicators that we would most likely include in a lighter EF menu item. Additionally,

we had a suggestion that the price increase would be better indicated by a percentage per item rather than absolute value per item. We agree with this suggestion.

Question 10- People questioned how vegetarian applied to Blue Chip. Although this was technically a correct questioning of the survey, we found many participants chose this as an important consideration. We feel that many people lack understanding of the term vegan and therefore vegetarian is more universal terminology.

The results of our survey suggest that Blue Chip customers are indeed uninterested in vegan products as Bev had suggested. They are however very interested in organic and local products to the point of being willing to pay a bit more for these products. (Please see conversation with Nancy Toogood for a response to this finding.)

Since our data findings are based on Blue Chip customers and therefore not accessing the complete potential market of Blue Chip customers, we have compared the results of our survey with the results of Group 15's survey about Blue Chip products to develop a larger view of potential customer demand. Group 15 also administered their survey to about 250 online participants mainly from the faculty of Land and Food Systems. The demographics of Group 15's survey body are as follows: 89% surveyed were undergraduates, 68% were females, and 73% were aged 19-24. Group 15's survey also suggests that most survey participants are not interested in vegan products. Additionally, their survey suggests that participants value price and taste as the most important qualities, followed by appearance, local and low fat, which were all closely ranked. This information supports what our survey results suggest.

FOCUS- REPLACING INGREDIENTS

As determined by research, interviews and our survey, we determine one way to reduce Blue Chip's EF is to replace some highly used, conventionally grown ingredients with their organic counterparts. By switching ingredients, many products would be affected. The

ingredients we decided to target were flour and chocolate. Both are used in large quantities, and both could be obtained through AMS ordering.

The EF of the chocolate and flour used will be reduced due to the curtailed use of pesticides and herbicides used on organically produced food. This switch would not affect the flavour or texture of Blue Chip's current menu items, nor significantly change the nutritional content. The switch would only change the EF of Blue Chip's menu items.

The introduction of organic ingredients is very marketable. The marketability has the potential to balance out the increased cost of organic ingredients. By switching to organic flour, Blue Chip's flour cost would be approximately doubled. However, when this is worked out per cookie, the increase is only about a two cents increase in food cost. By switching from regular chocolate chips to organic chocolate chips, the increase would be about six cents per cookie. These increases in price are minimal when compared to benefits that can be obtained by the reduction of Blue Chips EF.

FOCUS – REDUCING ANIMAL PRODUCT CONSUMPTION

As an animal-free option for Blue Chip, we are proposing a Ginger Molasses cookie recipe (see appendix), using a conventional, animal-product containing recipe adapted to animal-free ingredients using substitutions. We feel that cookies made from the proposed recipe maintain the flavour and texture of butter and egg containing cookies, but can offer a reduction in EF. We calculate the cost of these cookies using conventional (as opposed to organic) flour so we can evaluate the viability of animal-free and organic products independently.

The food cost of these cookies is about 21 cents each, and Blue Chip Cookies generally sell for about \$1.70. This leaves a food cost percentage of only 12%, and allows considerable potential for the potential of mark-up profit on this item.

Nutritionally, these cookies contain 296 calories per 100g with 82% kcal from carbohydrate, 12% from fat and 6% from protein, which, contains a slightly lower percentage of

fat and protein than is recommended for a complete diet (Barr, 2006). This is very nutritious when compared to President's choice Ginger cookies, which contain 480 kcalories per 100g of cookies with 40% kcal from fat and 5% from protein (President's Choice, 2008). In addition, our proposed cookies are also a good source of iron and folic acid.

Most importantly, with the use of canned pumpkin, we substituted a small EF item for the large EF item of butter. Collins and Fairchild (2007) give butter an EF of 23 times larger than processed vegetables (such as pumpkin). The potential for ecological saving is staggering. Add to this the replacement of eggs, which Collins and Fairchild give an EF of 2.4 times larger than processed vegetables, we feel that our animal-product free cookies can be marketed as a lower EF item. (Please note Collins and Fairchild study was done in Cardiff, Wales and could be significantly different from real values here in Vancouver, BC.)

FOCUS – REDUCING FOOD MILES

Another approach we have considered for Blue Chip is to recommend an item that utilizes items produced within British Columbia. We have developed a BC Bar (see appendix) that can be adapted to use British Columbia produced fruit fillings in season or as available from suppliers. We propose that, depending on the time of year, BC apples, pears, berries, rhubarb, pumpkin, and cranberries can be rotated as fillings for the BC bars. As with the cookie, we will calculate the cost of these bars using conventional, not organic, flour.

British Columbia sourced butter and eggs could also be utilized in this recipe. Even though these items are higher EF because of intensive production, their local production decreased the amount of food miles incorporated into their EF. Bentley and Barker (2005) illustrated that each person switching to consuming only locally sourced food can save over half a tonne of CO₂ emissions per year. If our BC Bar contains BC sourced fruit, eggs and butter, than 40% (by weight) of the bar is BC, and the resulting ecological savings would be significant

considering the scale of production. The use of local ingredients could also be a viable marketing tool according to our survey.

The food cost of these bars is about thirty-three cents each, and Blue Chip baked goods, such as scones, sell for about \$2.00. This leaves a food cost percentage of approximately 17%.

Although high in kilocalories at approximately 434 each, the BC Bar contains 29% kcal from fat and 65% kcal from carbohydrates, which is within the daily recommendations (Barr, 2006), but is somewhat low at 6% kcal from protein. For a butter-containing dessert bar, we feel this macronutrient profile of this bar provides nutritional benefits. These bars are also a good source of iron.

NEGATIVE RESULTS

Our research also uncovered information that was not useful and information that would have been interesting to pursue but did not fit the constraints of our scenario and/or our timeline. While looking at the source for the AMS EF indicators, we found the Sierra Youth Coalition indicators to pertain to an entire school or campus, with little related to the food system. Because of that, they were excluded from full review.

The possibility of creating an EF label with information on food miles and carbon emissions was seriously considered early on in our research. We felt it was something that could be used as an advertising tool, to increase awareness about these issues, to guide AMS purchasers and consumers in sustainable food consumption, and as an explanation of price increases. After reviewing the struggles Tesco, a European supermarket that is implementing such a label, it was determined the project would be too large in the time-frame given, and we instead suggest a much simpler label.

(Continued on next page)

The following are some of our failed ideas and reason for failure:

Unsuccessful Ideas	Reasoning
Vegan Muffins	Bev informed us that the muffins are purchased from a supplier and not made at Blue Chip. Thus, it would be difficult to propose any new vegan muffin recipes.
Flax seed cookies	Flax seed can be used as an option for replacing eggs; however, flax does give cookies an unfavorable flavor and can be labour intensive for bakers.
Vegan pastries	Making pastries without animal fat is difficult due to unfavorable textures and flavor
Organic/local sugar	This is quitey costly and it is hard to source local/organic sugar.
EF Label with measurable criteria	Difficulty with measuring EF and overall ambiguity (as noted in Tesco's attempt to create a label)

RECOMMENDATIONS

RECOMMENDATION: TO SUSTAINABILITY COORDINATOR

Recommendation: To review the AMS food ordering policy and create a program which guides the AMS purchaser in choosing the most ecologically friendly products available.

Justification: We found that the easiest and largest impact on the EF of food in the AMS would be to replace current ingredients with local and organic ingredients.

Discussion: This approach encourages the AMS to order more ecologically friendly products which in turn would affect all AMS food venues since the AMS does common ordering for its food venues. The following ordering policy is based on that of Yale University's dining services (Yale University). The ordering policy would aim to buy from tier one before tier two and tier two before tier three. Within each tier the categories are in order of most desirable to least desirable.

(Continued on next page)

Vegetable Guidelines		
First Tier (ranked in order of preference)	Second Tier (ranked in order of preference)	Third Tier (ranked in order of preference)
<ol style="list-style-type: none"> 1. BC organic 2. BC ecologically-grown 3. Regional organic 4. Regional ecologically-grown 5. BC conventional (small) 6. Regional conventional (small) 	<ol style="list-style-type: none"> 1. BC conventional (medium) 2. Regional conventional (medium) 3. Canadian/US. organic (small) 4. BC conventional (large) 5. Regional conventional (large) 6. Canadian/ U.S. ecologically-grown (small) 	<ol style="list-style-type: none"> 1. Candia/ U.S. organic (medium/large) 2. North America organic 3. Canadian/ U.S. ecologically-grown (medium/large) 4. International organic 5. Canadian/ U.S. conventional
Fruit Guidelines		
First Tier (ranked in order of preference)	Second Tier (ranked in order of preference)	
<ol style="list-style-type: none"> 1. BC organic 2. Regional Organic 3. BC conventional (small) 4. Regional conventional (small) 5. BC conventional (medium) 	<ol style="list-style-type: none"> 1. Regional conventional (medium) 2. Canadian/ U.S. organic (small/medium) 3. BC conventional (large) 4. Canadian/ U.S. organic (large) 5. International organic <p>Canadian/ U.S. Conventional</p>	
Meat and Poultry Guidelines		
First Tier (ranked in order of preference)	Second Tier (ranked in order of preference)	
<ol style="list-style-type: none"> 1. BC free-range/pasture-fed 2. BC organic 3. Regional free-range/pasture-fed 4. Regional organic 5. Regional conventional (small) 	<ol style="list-style-type: none"> 1. Canadian/ U.S. free-range/pasture fed 2. Canadian/ U.S. organic (small/medium) 3. Conventional (small/medium) 4. Canadian/ U.S. organic (large) <p>Canadian/ U.S. conventional (large)</p>	

Some of the difficulties with implementing an ordering policy is that it affects all AMS food venues and would require all venues to do a renewed cost analysis of their products and adjust their prices appropriately. To this end we recommend implementing such a policy in phases, starting with a limited number of products according to ability. We understand the difficulties in raising the costs of products, which means some ingredients may not be able to be included in this policy. Additionally, to responsibly suggest a renewed AMS ordering policy, a survey of all SUB visitors and AMS food venue customers must be done to gauge what price increases customers would tolerate and to evaluate the support of this type of policy. We recommend that an advertisement campaign be launched with the implementation of this policy to raise consumer awareness of the issues being addressed. These recommendations could be pursued with the help of a future AGSC 450 scenario group.

RECOMMENDATION: TO SUSTAINABILITY COORDINATOR

Recommendation: To establish an EF label for all food items in AMS food venues. As inspired by the idea of food labeling in The Pendulum Cafe, our group has developed a recommended example of an EF label along with an educational poster that address three vital categories: Organic, Local and Animal Product Free (see appendix).

Justification: Based on our background research, interview results and findings of the survey, we found that local, organic and animal-free were categories that generated public interest and/or had ecological impact and were easily classified.

Discussion: In order to move UBC towards sustainability, we think that it is vital for us to educate our campus community about sustainable food production. Through the posters and signage, customers not only will learn what the label is but also the importance behind it. Overall, we wish to bring public awareness to the matter of reducing our EF via developing a sustainable food production system.

RECOMMENDATION: TO BLUE CHIP

Recommendation: We recommend that Blue Chip switch from regular to organic flour for all baked goods produced in the SUB.

Justification: The use of organic flour would provide a reduction in fossil fuels used in the production phase of wheat, therefore contributing to a lower EF for the final baked good.

Discussion: The use of organic flour could be used as a marketing tool, as organic was one of the ecological concepts that many Blue Chip customers identified with. This change may not lead to the greatest reduction in Blue Chip's EF but it is considered to be one of the most feasible. The switch would result in a tripling of the flour cost per cookie, however, this results in a very small increase in total production cost (see appendix).

Marketing Plan: This recommendation fits well into our existing signage proposal, since many of the products contain a large percentage of flour: using organic flour allows for the

“organic” category of our signs to be checked off, and a high percentage number can be filled in the brackets for each baked good. Since our survey data indicated a strong interest in organic products, this switch is projected to be popular among customers.

RECOMMENDATION: TO BLUE CHIP

Recommendation: To introduce the animal-product-free pumpkin Ginger Molasses cookie (see recipe in appendix).

Justification: We found that replacing animal-based products with vegetable products could provide large ecological savings while still providing a desirable product for the consumer.

Discussion: We feel that reducing animal sources in Blue Chip’s recipes is one way to help reduce the EF associated with food production. Although not represented in the survey, Nancy Toogood expressed a demand for vegan.

Marketing Plan: Our three category signage system would allow us to market our Ginger Molasses Cookies as “Animal -Product-Free,” providing both vegan-seeking consumers and environmentally friendly seeking consumers with a highly visible product.

RECOMMENDATION: TO BLUE CHIP

Recommendation: To introduce the BC Bar, utilizing BC produced fruit, butter and eggs (see recipe in appendix).

Justification: Our research shows that reducing the food miles of goods used by consumers can cut down significantly on CO₂ emissions (Bentley and Barker, 2005), and our proposed BC Bars contain 40% BC produced foods.

Discussion: By featuring an item that utilizes more local sources, Blue Chip can reduce the EF associated with food production and bring visibility to the issue of food-miles.

Marketing Plan: The local food signage category could be utilized to illustrate that the BC bar is 40% “locally sourced” providing customers with a locally sourced food option that our survey indicated they were interested in.

RECOMMENDATION: TO AGSC 450

Recommendation: We recommend future AGSC 450 groups continue our work with Blue Chip to insure the change to organic flour can be completed. This would consist of working with the AMS buyer, Bev Teh, and the Blue Chip baking staff to ensure organic flour is incorporated into current Blue Chip recipes.

Justification: We feel we have made important discoveries and relationships that are important to the principles of the UBCFSP. We feel future AGSC 450 groups, the AMS and Blue Chip benefit from pursuing this task further.

Discussion: In regards to the Ginger Molasses cookie and BC Bar, we recommend future AGSC 450 groups perform focus groups and taste tests to ensure the products are acceptable on a large scale. It would also be important to work with the Blue Chip baker to ensure the recipes are tested and standardized.

Marketing Plan: We recommend a continuation of our marketing strategy, which involves signage that breaks down key EF concepts into three categories. Expansion of our marketing plan would build awareness among the UBC community about the impacts of locally produced, animal-free and organic food sources.

CONCLUSION

While we did not achieve all that we had hoped to, we made substantial headway in deciphering how AMS food venues can lighten their EF. We believe our work in the UBCFSP is valuable in the movement towards making campus and the world more sustainable.

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APPENDIX

Pumpkin Ginger Molasses Cookies

Recipe:

Preheat oven to 350°, yields 65 100g cookies

2 ½ c pumpkin puree 1 c vegetable oil 5 bananas (mashed) ½ c cornstarch 2.5 c molasses 5 c sugar	Mix in a large bowl until smooth
20 c flour ¼ c ground cinnamon 3 tsp ground cloves ¼ c ground ginger ¼ c baking soda	<ul style="list-style-type: none"> Combine in a large bowl Add wet ingredients to dry ingredients, slowly, while mixing
	Roll dough into 2 inch balls
	Roll tops of dough balls in sugar until lightly dusted
	Place on greased cookie sheet and flatten with spoon
	Bake 20 minutes, until browned and tops are cracked all over
	Remove from oven and let cool in pan for 5 minutes
	Cool cookies on rack

Cost of recipe:

Ingredient	Amount used	Unit Price	Cost per ingredient
pumpkin puree	625 mL	31.27/12x540 mL	3.01
vegetable oil	250 mL	22.79/16 L	0.35
bananas	136 g	1.65/ kg	0.22
cornstarch	65 g	6.48/ 5 kg	0.08
molasses	625 mL	3.46/ 355 mL	6.09
sugar	1000 g	12.39/10 kg	1.29
flour	2500 g	14.28/20 kg	1.79
cinnamon	31.2 g	20.80/2 kg	0.32
cloves	23.4 g	N/A (use cinnamon)	0.24
ground ginger	31.2 g	5.10/375 g	0.42
baking soda	55.2 g	0.91/500 g	0.10
		total cost	13.86

Food cost per (100 g) cookie = \$0.21

Nutritional Analysis (Dietitians of Canada, 2008)

Calories (kcal)	296	Folate (µg)	77.5
Fat (g)	4.1	Vitamin B ₆ (mg)	0.1
Protein (g)	4.4	Vitamin B ₁₂ (µg)	0
Carbohydrate (g)	60.9	Calcium (mg)	43.1
Sugar (g)	24.4	Iron (mg)	2.8
Fibre (g)	1.9	Sodium (mg)	244
Vitamin A (µg)	24.2	Potassium (mg)	302.6
Vitamin C (mg)	1.6		
Vitamin D (µg)	0		
Vitamin E (mg)	0.8		
Thiamin (mg)	0.3		
Riboflavin (mg)	0.2		
Niacin (ne)	3.4		

BC Bars:

Recipe:

Preheat oven to 350, yields 60 3x3 inch bars

16 c sliced BC apples (or other BC fruit) 2 c sugar ½ c cornstarch ¼ c lemon juice	<ul style="list-style-type: none"> Combine in a pot, heat over medium heat, stirring, until fruit is tender Set aside
9.5 c flour 12 c oats 1 tbsp baking soda 1 tbsp salt	Combine in a large bowl
3.5 c BC butter, softened 7.5 c brown sugar 1 c BC eggs 5 egg yolks 3 tbsp vanilla	Combine in another bowl, then add to dry ingredients
	reserve 1/3 of crumb mixture
	press other 2/3 of crumb mixture into bottom of sprayed pan.
	add fruit filling on top of pressed crumb mixture
	put reserved 1/3 of crumb mixture on top of fruit filling in large clumps
	bake for 45 minutes until golden brown
	cool on a wire rack, then cut into 3 inch by 3 inch squares

Cost of recipe:

Ingredient	Amount used	Unit price	Cost per ingredient
sliced apples	2768 g	1.84/ kg	5.09
sugar	400 g	12.39/10 kg	0.50
cornstarch	62.5 g	6.48/10 kg	0.04
lemon juice	60 mL	1.95/946 mL	0.12
flour	1188 g	14.28/20 kg	0.85
oats	2432 g	11.62/10 kg	2.83
baking soda	15 g	0.91/500 g	0.03
salt	15 g	1.38/ kg	0.03
butter	795 g	190.50/22.7 kg	6.67
brown sugar	1648 g	22.47/20 kg	1.85
eggs	245 g	39.20/ 12 kg	0.80
egg yolk	5	2.00/12	0.83
vanilla	45 mL	2.16/500 mL	0.19
		total cost	19.83

Food cost per (3x3 inch) square=\$0.33

Nutritional Analysis (Dietitians of Canada, 2008)

Calories (kcal)	434.2	Thiamin (mg)	0.3
Fat (g)	14.3	Riboflavin (mg)	0.2
Protein (g)	6	Niacin (ne)	2.6
Carbohydrate (g)	72	Folate (µg)	50.6
Sugar (g)	40.4	Vitamin B ₆ (mg)	0.1
Fibre (g)	3.3	Vitamin B ₁₂ (µg)	0.1
Vitamin A (µg)	112	Calcium (mg)	48.5
Vitamin C (mg)	2.3	Iron (mg)	2.5
Vitamin D (µg)	0.3	Sodium (mg)	282.7
Vitamin E (mg)	0.5	Potassium (mg)	256.4

Group 28 Ecological Footprint Label Template



Eco-Footprint Label

ORGANIC ()

LOCAL ()

ANIMAL PRODUCT FREE ()



Ecological Footprint Poster Template

4 Simple Steps to use **Eco-Footprint Label**

1) What is “Ecological Footprint” ?

By definition, “Ecological Footprint” is the estimation of an individual’s impact on the ecological system according to one’s lifestyle. The total amount of land that is required for one’s food production and waste absorption is used as an indicator of one’s impact to the eco-system.

2) How does this label works?

Each label contains 3 checkmark boxes: Organic, Local and Animal Product Free. When the box (es) are checked, it tells you how the food or its ingredient were produced. The bracket next to each category also provides you with additional information about the food. By looking at the label and reading this poster, you will get to know your foods better in terms of their impacts to our environment.

ORGANIC ()

LOCAL ()

ANIMAL PRODUCT FREE ()

Additional Information

3) Organic? Local? Animal Product Free?

As simple as it is, the 3 categories on this label represent exactly what they mean literally. For example if “Organic” is checked, this shows that the food item you are looking at contains ingredient (s) that are certified organic. While “Local” means the food contains ingredient (s) that are produced locally in B.C., “Animal Product Free” tells you whether if the food contains animal ingredients.

4) Why is it important?

Other than reducing green house emissions, reducing energy usage for food production is a significant way for us to reduce our impacts to the environment. Specifically, the options provided on the label are alternative ways for us to produce our food without excessive energy usage. In comparison, fertilizer usages in conventional farming, fuel usages in food transportation, and the foods for animal feeding represent a significant amount of energy that can be saved by using these alternative methods.

Still have questions? Feel Free to ask the staffs of your food provider!



Blue Chip Customer Questionnaire- Questions

Please circle that which applies to you or indicate otherwise.

1. Your role at UBC? (Undergraduate student, Graduate student, Faculty, Staff, Visitor, Other (specify):)
2. What is your gender? (Male, Female, Other (specify):)
3. What is you age? (18 & under, 19-24, 25-31, 32-55, 56 & over)

Please fill in the blank.

4. How often do you visit *Blue Chip Cookies*?
_____ times per week, **or** _____ times per month
5. How often do you buy a food item?
_____ times per week, **or** _____ times per month
6. When buying a product from *Blue Chip Cookies*, which qualities do you consider? (Rank from 1-6 with 1 being the most important)
___ Taste, ___ Price, ___ Appearance, ___ Low Fat, ___ Locally Produced, _ Vegan, Other (specify):

7. How would you rate the current baked goods selection at Blue Chip Cookies based on variety and quality? (circle one)
___Excellent, ___Good, ___Average, ___Below average, ___Poor
8. Please circle **any** of the **food options** you would like to see offered at Blue Chip (you many choose as many as you like).
Low Fat, Vegan, Environment Friendly, None
9. Are you willing to pay more for a more environmentally friendly food option? (circle one)
Yes, No
If so, how much **more per item** are you willing to pay? (circle one)
\$0.00 \$0.10 \$0.20 \$0.30 \$0.40 \$0.50 \$0.60 \$0.70 \$0.80 \$0.90 \$1.00
other: (specify)_____
10. Please circle the **2 most important** ecological food concepts to address at Blue Chip
Local Food/Food Miles, Certified Organic Food, Vegetarian, Vegan , None
11. Do you have any suggestions for decreasing the ecological footprint of foods at *Blue Chip Cookies*?

Survey Results

Question 1:								Question 2:			
	ug	gr	fac	staff	vis	other	Total	male	female	other	Total
	103	18	4	16	3	4	148	48	98	1	147
Percent	69.6%	12.2%	2.7%	10.8%	2.0%	2.7%		32.7%	66.7%	####	

Question 3:						
	<18	19-24	25-31	32-55	>56	total
	10	84	30	22	1	147
percent	6.8%	57.1%	20.4%	15.0%	0.7%	

Question 4:																					
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7.5	8	10	12	14	16	18	20	24	30	40
per week	13	4	22	2	29	4	10	1	9	2	2		1								
per month	15	2	6	1	9	3	1	0	2	0	0		1	3		1					
Total/month	15	2	6	1	9	3	14	0	0	4	0	22	3	32	4	11	1	9	2	2	1
Times/month	1-3.5	4-7.5	8-11.5	12-15.5	16-19.5	20-23.5	24-27.5	28+													
Times/week	<1	1,<2	2,<3	3,<4	4,<5	5,<6	6,<7	7+													
	36	18	25	36	12	9	2	3													

Question 5:																					
	0	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7.5	8	10	12	14	16	18	20	24	30
per week	17	28	2	21	2	11	3	7	1	2	2	1									
per month	5	16	0	7	1	16	2	1	0	1	0	0			2				1		
Total/month	5	16	0	7	1	16	2	29	0	1	2	0	21	2	13	3	7	1	3	2	1
	0	1-3.5	4-7.5	8-11.5	12-15.5	16-19.5	20-23.5	24-27.5	28+	* Other: 4 weird results											
	0	<1	1,<2	2,<3	3,<4	4,<5	5,<6	6,<7	7+												
	5	42	32	23	16	8	3	2	1												

Question 6:								* Ranks given values: 1=6, 2=5, 3=4, etc							
	Rank #1	Rank #2	Rank #3	Rank #4	Rank #5	Rank #6	Rank #7	Value	6	5	4	3	2	1	Total
Taste	103	13	5	4	1	1	0	Taste	618	65	20	12	2	1	718
Price	31	45	20	19	4	2	0	Price	186	225	80	57	8	2	558
Appearance	9	16	30	17	15	8	0	Appeara	54	80	120	51	30	8	343
Low Fat	12	9	18	21	26	9	0	Local	84	50	68	69	54	6	331
Local	14	10	17	23	27	6	1	Low Fat	72	45	72	63	52	9	313
Vegan	2	1	3	4	10	61	0	Vegan	12	5	12	12	20	61	122
Other	10	2	1	1	1	0	0								
Totals	181	96	94	89	84	87	1								

Question 7:							Question 8:				
	Excellent	Good	Average	Below Av	Poor	No Response	Low Fat	Vegan	Environ	None	No Response
Rating Scale	5	4	3	2	1	0	63	19	90	15	14
	43	65	23	3	0	13					

* Because this scale is roughly an interval scale we can do statistics on it.

Question 9:				Amount:												
	yes	no	Total	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	other	
	110	26	136	10	18	26	25	8	31	7	1	0	0	5	10	
Percent	80.9%	19.1%		Total Val: 0 1.8 5.2 7.5 3.2 15.5 4.2 0.7 0 0 5												
				Average Amount More People are willing to Pay 0.33												

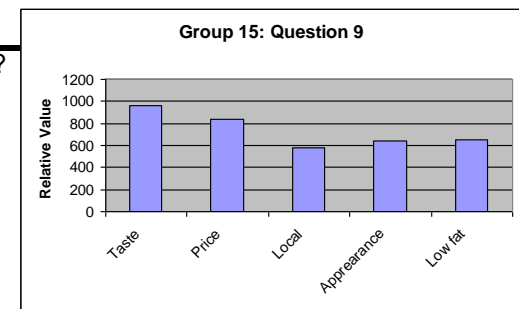
Question 10:		Percentage	
Local Food/Food M	111	43.2%	
Certified Organic	102	39.7%	
Vegetarian	20	7.8%	
Vegan	11	4.3%	
None	10	3.9%	
No response	3	1.2%	
total	257		

Group 15- Data & Analysis

Question 1: What is your affiliation with		
undergrad	250	89.6%
grad	10	3.6%
faculty/staff	2	0.7%
visitor	8	2.9%
other	9	3.2%
Total	279	1

Question 2: What is your gender?		
male	88	31.5%
female	189	67.7%
other	2	0.7%
Total	279	1

Question 3: What is you age?		
-18	42	15.3%
19-24	200	72.7%
25-31	26	9.5%
33-55	6	2.2%
56 +	1	0.4%
Total	275	1



Question 9: When buying a product from Blue Chip, which qualities do you

taste(rating)	Total	Percent	Value	price	locally produced
1	23	8.4%	23	1	27
2	9	3.3%	18	2	70
3	52	18.9%	156	3	306
4	191	69.5%	764	4	440
Total	275	100.0%	961	Total	274
					100.0%
					843
					264
					100.0%
					583

appearance	low fat
1	1
2	2
3	3
4	4
Total	Total
44	272
188	100.0%
288	651
120	