

THE BROWNIE EXPERIMENT:

An Analysis of Sustainable Labelling and Its Effect on Choice.

Cole Grabinsky - Community Design and Sustainability,
Devon Matthews - International Development Studies and Sustainability
Jeannine Jure - Management and Sustainability
Célyna Arnold - Neuroscience and Sustainability
Emily Cantwell - Sociology and Sustainability
Paige Marvel - Environmental Science

Final Report Submitted on April 17, 2015.
Course: ENVS 3502
Mentor: Nathan Ayer

Table of Contents

Executive Summary	2
Introduction	3
Background	3
Goals, Objectives & Scope	3
Rationale and Literature Review	4
Research Methods.....	6
Sample Population.....	6
Experimental Design.....	6
Experimental Conduct.....	8
Researcher Protocol.....	8
Pilot Study	8
Data Collection	9
Data Analysis.....	9
Delimitations and Limitations.....	9
Ethics.....	10
Results	10
Brownie Selection	10
Year of Study	11
Academic Area of Study	11
Factors Influencing Brownie Choice.....	12
Label Impact	13
The Effect of Price	13
Other Factors	14
Discussion	15
Subconscious Phenomena	15
Does Older Mean Wiser?	15
Taste Trumps Environment.....	16
It's All About The Labels.....	17
Financial Impacts	17
Conclusion.....	18
Recommendations for Action.....	19
Recommendations for Further Research.....	19
Acknowledgements.....	20
References	21
Appendices	23
Appendix A- Sustainable/Conventional Brownie Recipe.....	23
Appendix B- Labels.....	24
Appendix C- Survey	25
Appendix D- Sustainable Brownie Information Sheet	26
Appendix E- Investigator Tally Sheet	28

Appendix F- Ethics Application	28
Appendix G- Original Research Proposal	34

Executive Summary

The literature suggests that in total between twenty and thirty percent of the environmental impact in the western world is due to food consumption. As such, food choices are an important consideration in reducing environmental impact. Regardless of geographic location or economic status, decisions about food impact our daily lives. Due to the increasing awareness for environmental issues, there is an ever-increasing market for sustainable food.

The goal of this study was to explore the influence that food labeling could have on people's food choices in residence on a university campus. The aim was to simulate the choices that are made when comparing two products at the grocery store by baking batches of what we define as sustainable and conventional brownies and asking people to make a decision between the two. For the purposes of this project, sustainable food is defined as food that is organic, fair trade, and makes use of local ingredients. Our definition of conventional food is food that is non-organic, industrial-made with the use of pesticides, and does not use local ingredients.

The brownies that were baked were sustainable 'Brownie A' and conventional 'Brownie B' that were virtually identical in size and appearance (Appendix A), and of no cost to the student participants. We received funding from Dalhousie Student Union Sustainability Office (DSUSO) to pay for the brownie ingredients and laminated labels.

The only difference between the two brownies types was the labeling of the brownies as "Sustainable Brownie A" and "Conventional Brownie B". 257 surveys were conducted over two nights at Howe Hall Residence at Dalhousie University. The anonymous survey had seven questions that asked participants to indicate which brownie they chose, rate possible reasons for choosing the brownie, the degree labels affected their choice and if they would pay more for the brownie if Brownie A cost more than Brownie B.

Main results:

- 65% of participants chose Brownie A and 35% chose Brownie B.
- The levels of impact that the labels had on participants who chose Brownie A were evenly distributed over a range of no impact to great impact. Participants who chose Brownie B largely felt that labels had no impact on their choice.
- Perceived environmental impact had little influence among the majority of participants that chose Brownie B, however it was highly influential for participants that chose Brownie A.

- Of the participants that chose Brownie A, about half would have switched their choice if Brownie A cost more than Brownie B.

The implications of our study are that labels do have some effect on people's food choices. This supports the idea that food labeling is an important way to reduce the environmental impact of food. Our results could be useful in creating a standardized food labeling system for residences across campus. Our results could also be of interest to Rochelle Owen, Director of the Office of Sustainability, who is looking to improve sustainability on campus and among the student body.

Introduction

Background

Every day, people make choices about the food they eat and these choices have consequences for the planet. People's food consumption patterns and the intensification of agricultural practices have resulted in growing ecological damages around the world (Vanhonacker, et. al., 2013). In industrialized nations, it is estimated that around 25 percent of greenhouse gas emissions that are produced can be linked to food consumption (Czarnezki, 2011). Food consumption is one of the largest greenhouse gas emitting activities and this has serious ramifications for global climate change (Carlsson-Kanyama, et. al., 2003). Decision-making around food is therefore greatly important, as climate change has become one of the most pressing modern-day environmental issues.

Research has shown that dietary decisions made at the household and individual level can make a difference in reducing the environmental harms associated with food consumption (Campbell-Arvai, et. al., 2012). Many countries such as the United States, Canada, and those in the European Union have adopted certification and labelling standards to provide consumers with more sustainable food options. Organic food labelling programs are the most widespread, however carbon labelling and environmental life-cycle assessment programs for food are on the rise (Czarnezki, 2011). Labelling a product for its environmental sustainability is often referred to as "eco-labelling" and this is increasingly being used to guide consumers to make environmentally responsible decisions.

Goals, Objectives & Scope

The goal of this research project is to understand how students living in residence at Dalhousie University respond to eco-labelling strategies. Our research examines the question: How does food labelling affect food choices of Dalhousie University students living in Howe Hall residence? As a signatory of the Talloires Declaration, Dalhousie University has made a commitment to educate for environmentally responsible citizenship. Dalhousie University therefore has the responsibility to provide education for food choices made on campus and ensure that students are best equipped to make sustainable food decisions. The purpose of this research is to explore how food labelling influences consumer choice. Our conclusions will enable Dalhousie University to better promote

sustainable options on campus and ultimately empower students to make better decisions regarding food.

In an explanatory sequential mixed methods research approach, student food choices were examined by having them choose between two brownie options and surveying their opinions afterwards. “Sustainable Brownie A” was made with ingredients that were organic, fair trade, or local. “Conventional Brownie B” was made with ingredients that had no organic, fair trade, or local certification. This study used Fairtrade Canada and the Canadian Organic Regime standards for ingredients. Local ingredients were sourced from a 160km radius, which is consistent with the 100-mile diet movement prominent across North America (Smith & Mackinnon, 2007). We used these “sustainable” and “conventional” labels to see how students were persuaded or dissuaded from selecting the sustainable option. The brownies were given to participants at no cost, although a question about cost was in the survey.

The scope of the ‘Brownie Experiment’ was limited to Dalhousie University students living in Howe Hall located on Studley Campus in Halifax, Nova Scotia during the Winter 2015 academic term. Howe Hall is the largest residence building at Dalhousie University and is home to 716 students during the academic year. Sampling occurred on March 18 and 19, 2015 around dinnertime in the main foyer between the Howe Hall cafeteria and main entrance.

Rational and Literature Review

In today’s world, there is an acute awareness that the environment is suffering greatly at the hands of human-made pollution, contamination, and emissions. While there are innumerable changes that human society needs to implement in order to see decreasing rates of environmental degradation and climate change, no area is more relevant to people than the changes needed in food consumption practices. These decisions impact our daily lives, regardless of our geographic location or economic status. As Czarnezki (2011) points out, the last decade has seen a rise in books and film such as Michael Pollan’s “The Omnivore’s Dilemma” and the documentary “Food Inc.” that have challenged our conventional views on how we produce, transport, and consume food (p.2). According to Czarnezki (2011) and countless others, consumers’ choices regarding the food that they eat contribute greatly to “the climate crisis, cause species loss, impair water and air quality, and accelerate land use degradation” (p.2). Vlaeminck, et al. (2014) argue “food consumption is one of the most important areas to improve environmental sustainability since it is responsible for one third of a household’s total environmental impact” (p.180). In fact, food consumption contributes between twenty and thirty percent of “the total environmental impact in the Western world”; it is therefore extremely critical to examine how people choose to consume food and adapt policies and procedures to encourage more sustainable consumptive behaviour (Tobler, et. al., 2011).

Due to increasing awareness of progressing environmental issues, Brecard, et al. (2009) as well as Sporleder, et al. (2014) indicate that there is an ever-increasing and robust market for sustainable goods. While the definition of what constitutes sustainable

food is flexible and largely undefined, for the purpose of this study we have referred to the definition provided by the Sustainable Agriculture Initiative (2013) which reads “sustainable agriculture is a productive, competitive and efficient way to produce safe agricultural products, while at the same time protecting and improving the natural environment and social/economic conditions of local communities” (as cited in Sporleder et al., 2014, p.62). This is important because our study integrates aspects of both environmental and social sustainability, which is less prominent in the literature than aspects of only environmental sustainability.

This project aims to analyze how eco-labelling on brownie samples impacts student choice at Dalhousie University Studley campus. According to Grunert, et al. (2014), there are an estimated 432 labelling methods in 246 countries around the world that dictate food and beverage sustainability standards. However, it is still largely unclear whether or not eco-labelling has a positive impact on consumer behaviour. Our experiment aims to uncover trends as to *why* students choose to consume either the sustainable or conventional brownie sample when given the chance to make this decision without cost being a factor in their decision-making process. There are two reasons why it was decided to not involve economic variables in our study. First, there is already a substantial body of literature that suggests that increased cost effects consumers’ willingness to purchase a sustainable product (eg. BreCARD et al., 2009; Sporleder et al., 2014; Van Loo, et al., 2014). Secondly, there was concern that by involving an economic variable, it would likely be challenging to get to the root of what drives decision making in relation to eco-labeling; the majority of students will be unwilling to pay to have a small sample of brownie. However, there is an aspect of the experiment that will allow the difference between student values surrounding food choice and willingness to pay to be seen. This will be valuable data as there are numerous studies that indicate that there is a drastic disparity between consumer’s ethics and values regarding food and their willingness to pay (BreCARD et al., 2009; Grunert et al., 2014; Vlaeminck et al., 2014; Rokka & Uusitalo, 2008). Sporleder et al., terms this the “attitude-behavior gap” (2014, p. 64) and argues that this is, at times, the biggest reason why consumers either do, or do not choose to consume sustainable food products. For the purpose of this study, the primary analysis is on “the role of environmental morale and environmental motivation” in individual student behaviour regarding sustainable food consumption (Frey & Stutzer, 2006, p.1).

Frey & Stutzer (2006) argue that there are four different factors that go into a consumer’s decision to choose sustainable products: “altruism [both pure and impure], social norms and reciprocal fairness, internalized norms, and intrinsic motivation”, and that frequently a combination of these factors affect an individual simultaneously (p. 5-6). An area of particular interest is in testing if students that choose the sustainable brownie do so because of concerns regarding consuming food that they perceive to be beneficial to their personal health rather than to environmental sustainability. Misra (2007) found that, when testing undergraduate students, there was very little concern with nutritional health labelling and information. This study evaluates whether this is because students are more concerned with environmental sustainability, or because labelling does not influence them.

There has been a tested connection between the level of personal “environmental morale” (Frey & Stutzer, 2006, p.8) that one has, and the choices that one makes concerning food. It has also been shown that there are numerous ways to change consumer behaviour without changing “environmental morale” (Frey & Stutzer, 2006, p. 8); for example instituting positive incentives outside of ethics based incentives can make those disinterested in being environmentally-friendly more likely to choose sustainable food products (Frey & Stutzer, 2006). Previous studies with similar demographics have indicated that roughly half of the student population possessed knowledge regarding the ethics of sustainable food and that this translated into a sixty-five percent response indicating that they would prefer sustainable food options on campus (Dahm, et al., 2009, p.195). If studies – such as “The Brownie Experiment” – are able to discover that there is a significant base of “environmental morale,” (Frey & Stutzer, 2006, p. 8) or conversely, a significant lack thereof within the student population at Dalhousie, the results of this data could inform strategic changes to food labelling. Thus, focusing on consumer behaviour is an important area of focus, and relevant to the Dalhousie community.

Research Methods

Sample Population

The population in consideration for this experiment is students that dine at Howe Hall at Dalhousie University. The demographic of the study is thus composed of primarily first year students by nature of residence populations at Dalhousie. There was however the opportunity for upper year students to be involved in the study. Their participation was evaluated by means of a question in the survey prompting the participant to identify their year of study. Individuals that were not Dalhousie University students were excluded from the study. There are 716 total residents in Howe Hall. Based on a 95% confidence interval, the sample size was 251 students. Sampling was conducted by a non-probabilistic method. Intercept/convenience sampling was used until the quota for the sample size was met. Although this introduces some bias to the sample, it was the only feasible way to sample this experiment due to time, monetary, and information restraints.

Experimental Design

The brownies were prepared by following the recipe included in Appendix A.

The experiment was conducted in the main foyer area between the main entrance and cafeteria of Howe Hall residence at Dalhousie University. The data collection took place on two consecutive nights: March 18, 2015 18:30-21:00 and March 19, 2015 17:30-19:30. One researcher on the team was a Residence Assistant in Howe Hall residence, meaning that he was able to identify that no individual was able to participate more than once in the study. Three plain, non-descript tables were set up in the main foyer area where there was deemed a moderate amount of foot traffic. The center table was covered with a beige tablecloth to create a homogeneous background with no visual cues for brownie selection. It was clear apart from two identical neutral-coloured plates each displaying an identical

quantity of brownies. The two brownie displays appeared identical in every way. Each plate bore a single label written on white card. One label read the text “Sustainable Brownie A” and the other label read the text “Conventional Brownie B” (See Appendix B). All appearances of the display were neutral-coloured and identical in size, shape, and symmetry. No visual cues were present to influence the choice of the participant. On each side of the center table was an additional table on which printed surveys were placed for participants to complete following brownie selection (see Appendix C). Upon completion of the survey, participants handed the survey to researchers who promptly placed the survey face down among the pile of other completed surveys.

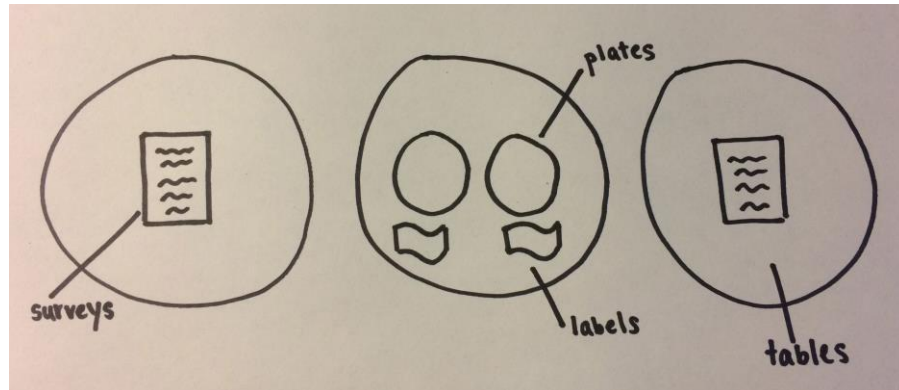


Fig. 1. Appearance of experimental set up for data collection including three tables, two plates, labels, and surveys. Placement of researchers, participants, and brownies is not shown.



Fig. 2. Appearance of brownie displays on plates, showing one plate labeled “Sustainable Brownie ‘A’” and the other labeled “Conventional Brownie ‘B’”, but giving no other visual cues. Photo taken March 18, 2015 in Howe Hall foyer at Dalhousie University.

Experimental Conduct

Student researchers were stationed by the table and approached students passing by to encourage participation in the study. The researchers identified themselves as upper-year Dalhousie students that were conducting a research project for a class. No identifying information about the class or faculty the student researchers belonged to was provided so as not to influence the participant's decision. Participants were informed that the study involved selecting a brownie from the two present choices followed by the completion of a short survey. At this point, participants were left to make a decision between the two brownies. If the participant prompted the researchers about dietary concerns, what makes each brownie "conventional" or "sustainable", or requested any additional information, the researcher gave the participant a piece of paper with the ingredient list for the brownie in question including how sustainable had been defined (see Appendix D). After the participant had selected a brownie, the participant took and ate their brownie and was prompted to answer a short survey about the decision making process (see Appendix C). In addition, researchers kept a tally in their notes about which brownie was selected and whether that participant asked for more information given their brownie selection.

Researcher Protocol

- Researchers gave no identifying information about taking courses, having interest in, nor being in a faculty that has ties to the environment.
- No visual cues were given to bias a participant's decision (e.g. gesturing to one of the brownies)
- Researchers did not give any descriptive information about the brownies or experiment unless prompted, at which time researchers only gave the sheet of paper and no additional verbal information.
- Researchers made every effort to be objective conductors of the experiment and observers so as not to create any visual, audible, moral, or other bias in participant responses.

Pilot Study

A pilot test of the experimental procedure was conducted on March 17, 2015. It was conducted during a group work period in the Dalhousie University ENVS/SUST3502 class. Members of the class were asked to volunteer as pilot test subjects. The brownie display was set up on a rectangular table at the front of the classroom, bearing near identical resemblance to the actual experimental set-up in Howe Hall. Volunteer test subjects were asked to come one by one to select a brownie and complete a survey. As was expected, due to the very biased nature of the pilot test sample, nearly all participants selected the sustainable brownie and expressed great care and consideration for their choice and its environmental ramifications. Researchers were aware of this phenomenon and knew that the pilot test sample was not likely to be representative of the Howe Hall sample population in this way. It was predicted that Howe Hall participants would likely be much more "normal", in that they would not be considerate of the environmental implications of

their actions the way that upper year students in environmental programs would be. The pilot test proved to be a valuable learning experience. It was discovered that participants were confused by the term “socioeconomic” that was used in question 4, therefore it was exchanged for the term “financial benefit”. In addition, it was observed that participants did not flip over their surveys and read the final survey question, and thus often did not complete it. In response to this, the survey was altered so that text was slightly smaller to allow all questions to fit on one side of the paper.

Data Collection

Quantitative data was collected through a tally of how many participants chose the conventional brownie (without asking for further information), chose the conventional brownie and asked for further information, chose the sustainable brownie (without asking for further information), or chose the sustainable brownie and asked for further information (see Appendix E). Some quantitative data was also obtained through questions on the survey that were not open-ended questions, or questions that had a finite number of answers (e.g. What is your program?). The survey also provided qualitative information in the form of open-ended questions. This mixed methods approach was useful because the quantitative data was available for analysis using descriptive statistics; while qualitative data allowed for an understanding of what the thought processes and motivations are of participants in the brownie selection.

Data Analysis

Due to the integrated mixed methods approach of the experimental data collection, there were a variety of available possibilities to analyze the data. The quantitative data from the tallies (see Appendix E) and survey questions 1 through 6 (see Appendix B) were analyzed using descriptive statistics. Each of these quantitative questions was assigned its own numerical codes to indicate possible answers. For example, for question 2 if Brownie A was selected, then that data point was coded as 0, whereas if Brownie B was selected, that data point was coded as 1. Quantitative data was analyzed by entering into a spreadsheet using Microsoft Excel 2011 and applying formulas to find the mode of the distribution of answers for specific questions. Also, it was compared how participants answered questions 1 through 6 given their previously indicated brownie selection. These yielded absolute numbers and percentages of certain responses given brownie selection. Histograms and pie charts were then created using the results of these statistical analyses. Finally, a grounded a posteriori context sensitive scheme was used for qualitative analysis of the open-ended questions from the survey (questions 4, 6, and 7). The codes and their frequencies were observed to see what additional motivating trends were present in the brownie decision-making process.

Delimitations and Limitations

This experiment faced an array of limitations. This experiment was a case study of a very specific population, meaning that it could prove challenging to create causal inferences about other situations based on the results of this experiment. In addition, the

method of a survey is limited because it can force participants into a certain response even if their desired response is not present. Also, a survey is unlike an interview in that participants are unable to clarify questions; therefore answers might not have been as precise as desired. Another limitation is that there were a variety of traits displayed by participants, regardless of attempts to sample a uniform demographic. Therefore, it is hard to create consistency in samples. Based on decisions of delimitations, the sample was also composed of primarily first year students by nature of the fact that residence is mostly composed of those students. A final limitation was that we excluded individuals from the proposed sample population due to food preference. If an individual did not like brownies, they were unlikely to participate in our experiment. Delimitations of the study are that of Dalhousie University students, we only sampled from those on Studley Campus that were in Howe Hall and walked past our table during the specified hours on the given sampling day.

Ethics

See Appendix F for ethics application. The application was approved.

Results

Brownie Selection

Out of 257 participants, 167 participants selected Brownie A. Of those participants that selected Brownie A, 32 of them asked for more information than simply the labels. The remaining 90 participants selected Brownie B. Of those participants that selected Brownie B, 6 of them asked for more information. This translates to 65% of participants selecting Brownie A, 12% of which wanted more information, and 35% of participants selecting Brownie B, 2% of which wanted more information.

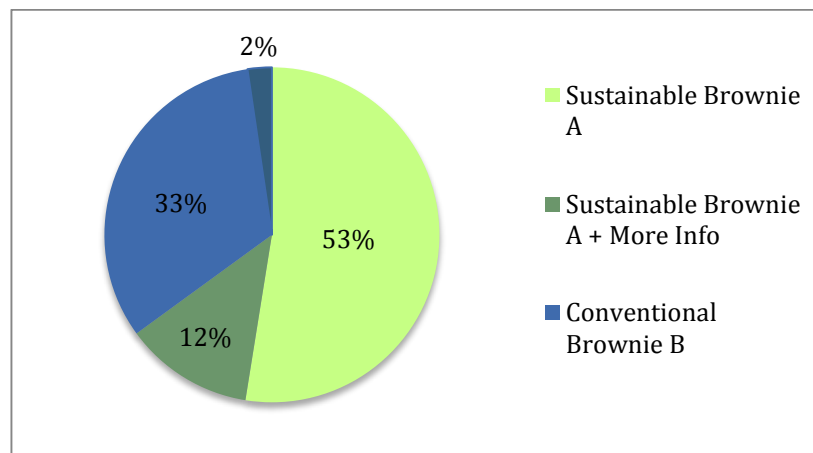


Fig. 3. Pie chart indicating brownie selections (in percentages) by Howe Hall participants at Dalhousie University, March 18-19, 2015.

Year of Study

Considering the sample population was the residents of Dalhousie University's Howe Hall, which hosts a majority of first year residents, it is logical that most participants were in their first year of study. Of the participants in their first year of study, 130 selected Brownie A whereas 74 selected Brownie B, indicating that almost twice as many first year participants selected Brownie A than those that selected Brownie B. Of the participants in their second year of study, 13 selected Brownie A whereas only 2 selected Brownie B. Although this is a very small quantity to draw any sort of conclusion from, it can still be noted that approximately six times as many students in their second year of study selected Brownie A than those that selected Brownie B. For the few participants that were in their third year of study or fourth year of study, both years of study saw an equal number of participants select Brownie A compared to Brownie B.

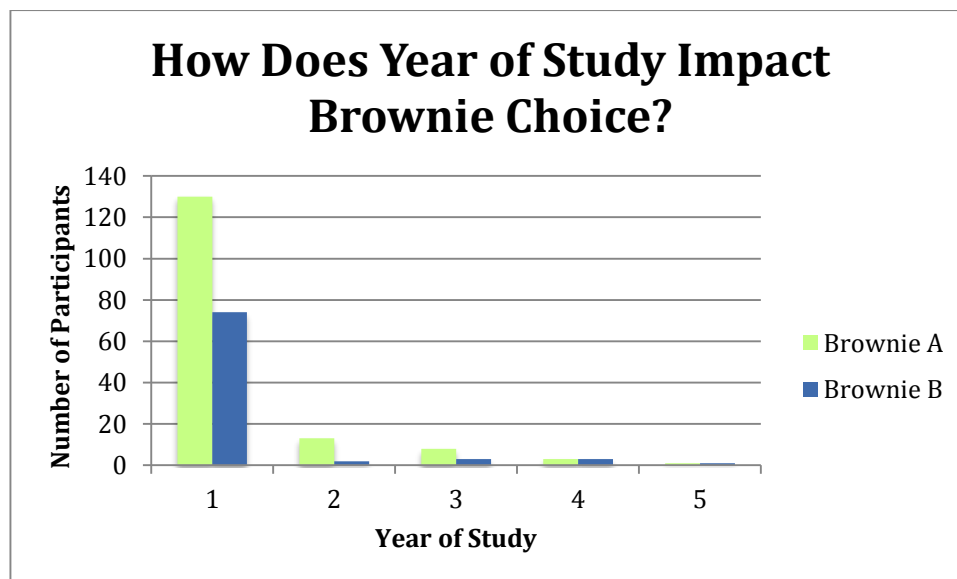


Fig. 4. Histogram indicating the quantity of participants that selected Brownie A or Brownie B given their academic year of study. Data collected March 18-19, 2015 in Howe Hall at Dalhousie University.

Academic Area of Study

When designing the survey, one of the objectives was to compare brownie selection to the participant's academic area of study. This was done in hopes of identifying if certain academic programs tended to contain participants that approach food decisions in different ways. During pilot testing, this question remained relevant because the pilot test was conducted on classmates within the environmental program. Although many valuable lessons were learned during pilot testing, the issue with the question regarding academic area of study was not identified because many of the pilot test subjects identified themselves as being in specific programs such as planning or sustainability which can be

easily drawn upon to create links about how individuals may be motivated differently considering that they were in an environmentally-based program.

However, upon gathering and consolidating the survey data, the information about academic area of study did not prove to be meaningful. Considering that the sample population was Howe Hall residence students, most of whom are in their first year, many participants were not able to identify their area of study past being in Science or Arts & Social Sciences.

Considering the questionable correlation and subjective nature of trying to connect very general areas of study like management or science to a predisposition to make decisions with an inherent environmental consideration, it was decided that the data collected from this survey question was not meaningful, and thus would not be analyzed further.

Factors Influencing Brownie Choice

The fourth question of the survey prompted participants to indicate to what degree various factors influenced their brownie decision using a Likert scale question. For all parts of question four, participants rated the factors from 1 to 5, where 1 represented no influence and 5 indicated a major contributor.

For “Appearance of brownie”, the mode of survey answers was 5, indicating that appearance is of great importance to consumers when making food-related decisions. The question of “Perceived taste” had a mode of 4, suggesting that participants quite strongly associate this factor with brownie choice. “Perceived benefits to personal health” received a mode of 1, meaning this factor had no influence on decision-making. “Perceived impact on environment” received a mode of 1, meaning that most participants did not think about the environment during brownie choice. “Financial benefits for the producers” also received a mode of 1, thus having no part of the decision-making rationale of participants.

A space was left for participants to indicate an “Other” factor that influenced their decision. The mode for the rating of this factor was 5. A grounded a posteriori context-sensitive scheme was used and gave the following codes (listed in decreasing order of importance): Proximity to participant, Size of brownie, Visual appearance, Random choice, Labels, Curiosity, Influenced by friend’s choice, Ethical decision, and Freshness.

Although brownies were made to be as identical as possible, they were not machine-made, and thus it is impossible for them to be completely identical. Thus, it can be concluded based off of the qualitative data that some participants still sought out any tiny difference among near-identical brownies in pursuit of a superior choice. Modes were also done to see whether participants that selected Brownie A versus Brownie B rated factors differently, however results did not differ from the overall results of the sample as a whole.

Label Impact

Question 5 of the survey prompted participants to indicate the degree to which the labels on the brownies affected their brownie choice. Based on the participants that answered Question 5 and selected Brownie A, 34.62% answered, “Had no impact”, 36.54% answered, “Had some impact”, and 28.84% answered “Had great impact”. Based on this, it can be observed that participants that selected Brownie A were fairly evenly distributed between the three levels of label impact. The most popular response for those that chose Brownie A was “Had some impact”, but only by a minute amount. Of the participants that selected Brownie B, 51.76% answered, “Had no impact”, 37.65% answered, “Had some impact”, and 10.59% answered “Had great impact”. It can be observed that participants that selected Brownie B largely felt that the labels had no impact on their decision.

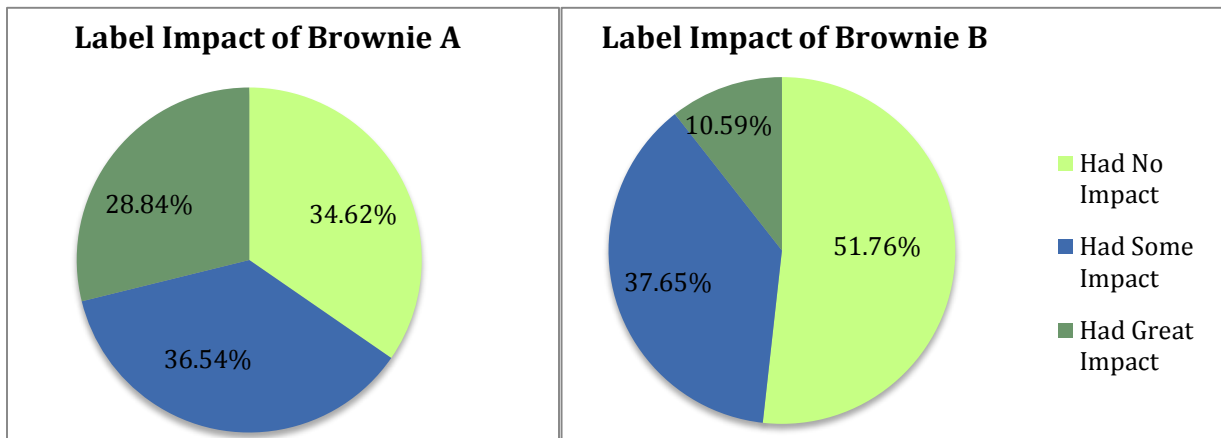


Fig. 5. Percentages of participants that selected each brownie type that indicated that labels “Had No Impact”, “Had Some Impact”, or “Had Great Impact” on their brownie selection. Data collected March 18-19, 2015 in Howe Hall at Dalhousie University.

The Effect of Price

The experiment was conducted in a setting absent of monetary cues. To deduce whether price would have an impact on brownie selection, Question 6 prompted the participant to indicate whether they would alter their brownie selection if Brownie A were made to cost more than Brownie B. On the survey, four options were offered to answer Question 6, however, depending on brownie choice, some answers were not mutually exclusive. To analyze this data, if a participant had selected Brownie A, the data of “It would not affect my decision” and “I would have chosen brownie A over brownie B” were amalgamated into one category. Similarly, if a participant had selected Brownie B, the data of “It would not affect my decision” and “I would have chosen Brownie B over Brownie A” were combined into a single category. Upon analyzing the data regarding the relationship between brownie choice and willingness to pay, it can be seen that most participants that

selected Brownie B would not change their brownie choice if Brownie A were more expensive.

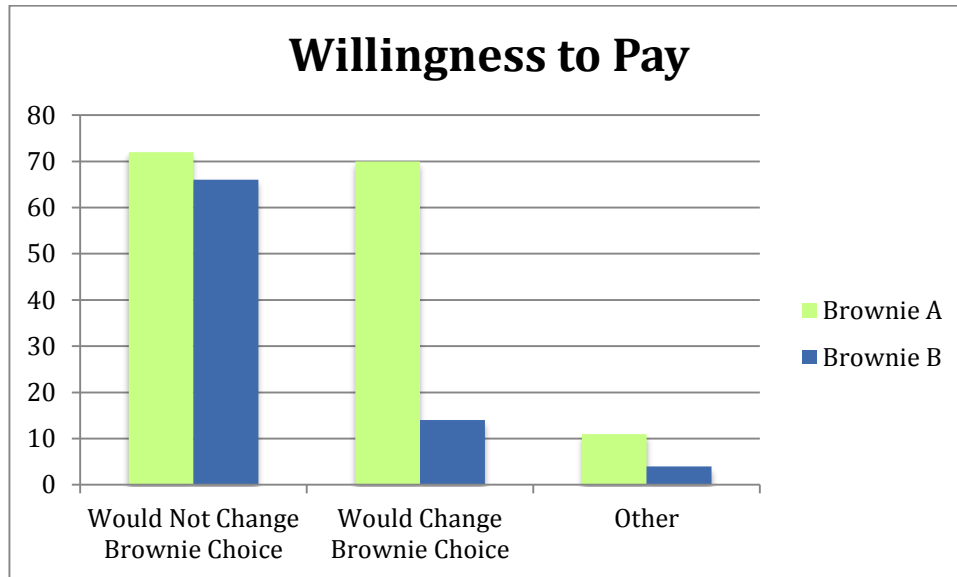


Fig. 6. The answers of participants to survey question 6, about whether or not they would change their brownie decision if one brownie were more expensive than the other, given their previous brownie selection.

The grounded a posteriori context-sensitive scheme that was applied to the qualitative results of the “Other” category yielded responses that fit the following codes (listed in decreasing order of importance): Depends on the price difference, Unsure, Would need more information about the product before deciding, Usually always choose sustainable regardless of price, Would spend more time considering choice if cost different amounts, Would make decision based on size of brownie, Would not purchase a brownie at all.

Other Factors

The final question of the survey prompted participants to add any thoughts or factors that had been present in their decision-making process that had not already been discussed. The grounded a posteriori context-sensitive scheme gave the following codes (listed in decreasing order of importance): Visual appearance, Presentation of brownies, Smell, Thought that they were being tricked and that brownies were in fact the same, Size, Friend influenced decision, Labels were vague, Decision was based on a mix of concerns including personal, environmental, and social well-being, They chose based on what they perceived would pair better with wine.

Discussion

Subconscious Phenomena

The majority of participants selected Brownie A. There are a few possible explanations for this phenomenon. Firstly, as hoped as an objective of the experimental design, participants could have contemplated the implications of the two labels. The survey questions outlined various factors that the research group identified as being relevant to a decision between a “sustainable” product versus a “conventional” product. The majority of participants may have considered these factors and thus decided upon Brownie A as a superior choice.

A second possible explanation is that the wording of “Brownie A” suggested a connotation of the letter “A” with being superior. Much like the grading systems in schools, “A” is the best possible mark, so a potential subconscious factor at play could be the association of “A” with being the best.

Although through observation, it appeared that participants approached the experimental set up evenly from the two directions in the foyer, no definitive count was kept of this, so a third explanation for participant selection of Brownie A could be that more participants approached the table from the side on which the plate for Brownie A was placed, meaning that proximity played a factor in brownie selection.

Fourth, it was observed by researchers that many participants approached the experiment accompanied by a friend, which would influence their brownie selection. In Malcolm Gladwell’s novel “The Tipping Point: How Little Things Can Make a Big Difference”, it is found that despite the decision that an individual truly wishes to make, the influence of a friend is likely to change that individual’s selection. In the case of a group of friends ordering beer, if Friend 1 and Friend 2 both mentally decide to order the pale ale, when Friend 1 first orders the pale ale, Friend 2 is more likely to change his decision to a different beer type (Gladwell, 2000). Similarly, when choosing brownies, it was observed that many participants would choose the opposite brownie type from the choice of their friend that preceded them.

A final explanation could be that unknown connotations with the terms “sustainable” and “conventional” could have been at play, for example participants could associate “sustainable” with being wholesome and good whereas “conventional” could be associated with being boring.

Does Older Mean Wiser?

It was anticipated that a trend might be seen between brownie selection and year of study, in that as year of study became greater, there might be more consideration put into brownie choice and thus more selection of Brownie A. However, the reverse trend was

observed where for participants in their first or second year of study, a large majority selected Brownie A. As year of study increased to be third year or greater, there were fairly equal quantities of participants selecting Brownie A versus Brownie B. One explanation for these trends could be that participants in their first or second year of study are younger and have had fewer years of education than upper year participants, and thus are more willing to accept without questioning that a brownie labeled as “sustainable” is true to its name. Upper year participants may be more skeptical due to an increased level of education and critical thinking skills, causing them to question the nature of a product labeled as “sustainable”, and thus be evenly split between the two brownie choices.

However, another factor could be that participants in their first or second year of study are fairly new to the world of food decision-making, and are thus excited to exercise their consumer power in making choices that they believe are “sustainable”. In comparison, it could be that upper year participants have been making food decisions for longer in their lives, and are thus less impressed with the advertising or labeling that food products use, and would rather remain with a product that has more of a sense of being tried and true. Despite these explanations, no true conclusions can be drawn from the data about students in an academic year of study greater than first year because so few participants fell under these categories.

Taste Trumps Environment

Among the answers received through Question 4 of the survey, each of the motivating factors on choice revealed varying degrees of influence for both Brownie A and B. It was found that participants who chose Brownie B were highly influenced by the appearance of the brownie. However, for those who chose Brownie A, appearance did not have as much of an impact on their decision. From this it can be assumed that most people who selected Brownie A disregarded appearance and considered other factors, while Brownie B participants mainly considered the immediate appearance. In terms of perceived taste, both those who chose Brownie A and Brownie B felt this was an influential factor in their decision. Assumptions here conclude that regardless of other factors, all consumers are motivated by perception of taste when they make a food selection. Further data shows that perceived benefits to personal health had no influence on the vast majority of participants. Here it can be assumed that participants instantly neglected aspects of personal health because eating brownies are already associated with unhealthy consumption. In this aspect, perceived benefit to personal health is a factor which would be better measured in further studies by sampling a food item that is relatively healthy and not associated as a dessert item.

The majority of participants who chose Brownie B responded that perceived environmental impact had no influence on their decision. These results suggest that participants either do not have a general concern for the environment, or that they did not contemplate the “sustainable” label and its associated meanings when making their selection. On the other hand, although the majority of participants who chose Brownie A responded that perceived environmental impact had no influence, there were more participants that said it was influential to some degree than indicated by participants that

selected Brownie B. Thus it can be seen that the “sustainable” label did in fact influence consumer’s choice and lead some participants to choose Brownie A based on the perceived environmental considerations.

Lastly, the data shows that financial benefits for the producers had no influence on the vast majority of participants, regardless of whether they chose Brownie A or B. However, among those who did respond that financial benefits for the producers were highly influential, almost all respondents had chosen Brownie A. Here it can be assumed that the few people that do consider producer benefits are individuals that are much more aware of the sustainable implications associated with food consumption as a whole, whether social or environmental. However, the majority of people do not consider the producers behind their food selection. This may be due to the growing disconnect between food production and food consumption, where many consumers are unaware of how and where their food was produced, just that they purchased it at the grocery store. Taste, health, and the environment are all motivating factors that play key roles in decision-making around food, yet benefits to producers appears to be a factor many do not take into consideration when guiding their food selection.

It’s All About The Labels

In addition to the results of our survey, there were also a number of behaviours that were observed while participants were selecting their brownie. Many participants simply reached for the closest brownie, seemingly paying no attention to the labels. There were also many participants that took a prolonged amount of time to debate their choice, as they were not sure what the word sustainable meant. Based on these observations, it would be expected that most participants would indicate that labels “Had No Impact” on their brownie choice. This was the type of distribution that was seen for participants who chose Brownie B, but not for Brownie A. The fact that those who chose Brownie A showed a more even distribution between the three options, ranging from no impact to having great impact, indicates that the labeling does likely have some influence for those participants who chose Brownie A. Considering that Brownie A and B were virtually identical, other than the factor of proximity depending on where the participant chose to stand while making their brownie selection, nothing other than labels should have been able to influence the decision, and yet many participants felt that the labels did not in fact influence them. Rather, the results seem to reflect that participants may not be as aware of the visual cues present in their food choices as they think they are.

Financial Impacts

In Question 6 of the survey, participants were asked if they would change their brownie selection if one brownie were more expensive than the other, given their previous brownie selection. Of the participants who chose Brownie A, it was almost an even split between those who would have changed their brownie choice and those who would not have. Sporleder, et al. (2014) suggests that people who have a quality-oriented preference are more likely to remain with the product they deem to be of superior quality, whereas individuals with a price-oriented preference are likely to have decisions motivated

primarily by comparative price. These preferences can provide explanation for the dichotomy between participants that wish to stay true to their decision regardless of price versus participants that will change their decision based on price.

In addition, it is logical that participants that had selected Brownie B when price was not a factor would not change their selection when there was a price difference. Considering that the lower price of one product in comparison to the other is often a motivating factor in product selection, it makes sense that those that had selected Brownie B when price was not a factor would remain with that brownie when it became the less expensive choice. The only logic behind an individual changing their brownie selection from Brownie B to Brownie A when Brownie A became the more expensive choice would be if participants associated higher price with higher product quality, making Brownie A the superior product in their minds.

Of the participants who chose Brownie B, most of them would not have chosen Brownie A if it were more expensive. This is logical given that they already chose Brownie B and were not as moved by an environmental motivation. Brecard, et al. (2009) suggests that another potential variable in choice of brownie and willingness to pay is that when customers are confident in the certifying organization, they are willing to pay more. This experiment used simple non-standardized labels and as such, participants may have lacked confidence in Brownie A without the presence a sustainability certification.

Conclusion

This research aimed to identify perceptions surrounding sustainable food labelling among students living in Howe Hall residence at Dalhousie University Studley Campus. The study analyzed the potential of various factors and their perceived influence on consumer choice, as well as the impact of sustainable labelling. This study sampled a proportionate group, representing the overall residence population, to develop a better understanding of the motivational factors behind the selection food products based on their labels indicating sustainability.

The results gathered provide an understanding of how labelling systems for food are currently being perceived and the extent of labelling significance. Food labels exhibited varying efficacy in providing sustainable choices for consumers. Most consumers are preoccupied with taste and appearance, rather than environmental and social impacts when making food decisions. When it boils down to a difference in cost, people show a preference for the less expensive option, regardless of what they would choose when price was not a factor.

Dietary decisions made at individual levels can have great influence in reducing the environmental harms associated with food consumption, and the results of this experiment have allowed for the development of recommendations for Dalhousie University to implement and better understand issues surrounding the labelling of food on campus.

Ultimately, the significance of this study was to provide an analysis of the perceptions surrounding sustainable labelling, or lack thereof, and its impact on consumer choice. The results provide Dalhousie University with useful information on the management of food systems and how to best integrate environmental considerations that will have most impact on consumers.

Recommendations for Action

Based on the results of the study, it is recommended that Dalhousie Food Services implements a sustainable food labelling system to inform students of the environmental implications associated with the various food options presented to them. Based on their choice that will be influenced by such labels, there is hope to see an increase in food choices that result in improved environmental and social impacts. Food decisions are complicated. What's not complicated is that sustainable labelling does work. Given that of the 65% of participants that chose the sustainable brownie, two thirds identified that the labels had some or a great impact on their choice, it is evident that sustainable labelling does serve a useful function. Based on this, it is recommended that food services look for ways to implement a sustainable labelling system so that students can identify which of their food choices in residence have lesser environmental and social implications tied to their sourcing.

Recommendations for Further Research

For further research we recommend that Food Services analyze sustainable labelling from a greater population by incorporating a larger sample size that is representative of the majority of Dalhousie University students and faculty. Considering that this sample was of primarily first year students, further data gathered on the rest of upper year students and faculty members would provide a deeper, more representative understanding on sustainable food labelling. This research could also be further aimed towards the campus as a whole by researching the potential to implement sustainable labelling in all food services across campus, rather than just meal halls. If this is pursued, research could also further analyze the economics behind paying more for "sustainable" food, and study whether implementing a system across all food vendors would be viable in terms of consumer's willingness-to-pay.

Furthermore, this study made every effort to maintain the similarities between the two labels in order to ensure that the only visual cues were the terms "Sustainable" and "Conventional". Further studies should explore how a varying number of factors between the labels could affect choice. Given that the goal is to create an effective labeling system that could influence people's choices towards more sustainable choices, perhaps the colours and design of the labels should be manipulated within experimental conditions to determine what labelling system best draws attention and interest to the origins of the products that individuals are buying. To extend this, further studies could also involve testing opposing label systems while integrated into a display of other products or advertising to better represent the environment where students will be making their choices.

Acknowledgements

We would like to thank DSUSO for providing funding that enabled us to conduct our study, and to Dean Martin at Howe Hall for granting us space to conduct our study. We are indebted to the mentorship and wisdom offered by Mr. Nathan Ayer and Dr. Tara Wright – thank you for your guidance in the writing of our research proposal (see Appendix G) and the completion of our final report.

References

- Brécard, D., Hlaimi, B., Lucas, S., Perraudeau, Y., Salladerré, F. (2009). Determinants of demand for green products: An application to eco-label demand for fish in Europe. *Ecological Economics*, 69, 115-125.
- Campbell-Arvai, V., Arvai, J., & Kalof, L. (2012). Motivating sustainable food choices: The role of nudges, value orientation, and information provision. *Environment and Behavior*, December, 1-23.
- Carlsson-Kanyama, A., Ekström, M. P., & Shanahan, H. (2003). Food and life cycle energy inputs: consequences of diet and ways to increase efficiency. *Ecological economics*, 44(2), 293-307.
- Czarnezki, J. J. (2011). The future of food eco-labeling: organic, carbon footprint, and environmental life-cycle analysis. *Stanford Environmental Law Journal*, 30(3), 1-49.
- Dahm, M., Samote, A., & Shows, A. (2009). Organic foods: Do eco-friendly attitudes predict eco-friendly behaviors. *Journal of American College Health*, 58(3), 195-202.
- Frey, B. S., & Stutzer, A. (2006). Environmental morale and motivation. *Available at SSRN 900370*. Retrieved from: <http://www.zora.uzh.ch/52245/1/iewwp288.pdf>
- Gladwell, M. (2000). *The Tipping Point: How Little Things Can Make a Big Difference*. Boston: Little, Brown.
- Grunert, K. G., Hieke, S., Wills, J. (2014). Sustainability labels on food products: Consumer motivation, understanding and use. *Food Policy*, 44, 177-189. doi: 10.1016/j.foodpol.2013.12.001
- Misra, R. (2007). Knowledge, attitudes, and label use among college students. *Journal of the American Dietetic Association*, 107(12), 2130-2134.
- Rokka, J., and Uusitalo, L. (2008). Preference for green packaging in consumer product choices- Do consumers care? *International Journal of Consumer Studies*, 32, 516-525. doi: 10.1111/j.1470-6431.2008.00710.x
- Smith, A., & Mackinnon, J.B. (2007). *The 100-mile diet: A year of local eating*. Canada: Random House.

- Sporleder, E. M., Kayser, M., Friedrich, N., Theuvsen, L. (2014). Consumer preferences for sustainably produced bananas: A discrete choice experiment. *International Food and Agribusiness Management Review*, 17(1), 59-82.
- Tobler, C., Visschers, V., and Siegrist, M. (2011). Organic tomatoes versus canned beans: how do consumers assess the environmental friendliness of vegetables? *Environment and Behavior*, 43(5), 591-611. doi: 10.1177/0013916510372865
- Vanhonacker, F., Van Loo, E.,J., Gellynck, X., & Verbeke, W. (2013). Flemish consumer attitudes towards more sustainable food choices. *Appetite*, 62, 7-16.
- Vlaeminck, P., Jiang, T., Vranken, L. (2014). Food labeling and eco-friendly consumption: experimental evidence from a Belgian supermarket. *Ecological Economics*, 108, 180-190. doi: 10.1016/j.ecolecon.2014.10.019
- Young, W., Hwang, K., McDonald, S., & Oates, C. J. (2010). Sustainable consumption: green consumer behaviour when purchasing products. *Sustainable Development*, 18(1), 20-31. doi:10.1002/sd.394

Appendices

Appendix A

Sustainable/Conventional Brownie Recipe

Below is the recipe one batch of sustainable brownies. The conventional brownies were made using the same ingredient measurements and methods, but simply replaced all local, fair-trade, organic ingredients with conventional ingredients.

Ingredients:

- 115g Unsalted Organic Butter, softened
- 170g Fair-trade Organic Caster Sugar
- 2 Local Organic Free-range Eggs
- 40g Local Fair-trade Dark Chocolate, finely chopped
- 55g Fair-trade Organic Dates, finely chopped
- 1 tsp Fair-trade Organic Vanilla Extract
- 1 tsp Baking Powder
- 55g Organic All-purpose Flour
- 55g Fair-trade Organic Cocoa Powder

Instructions:

- Preheat oven to 350 degrees F.
- Grease a 9x9 inch cake tin.
- In a large bowl, cream together butter and sugar. Beat in eggs, one at a time.
- Gently fold the dates and chocolate into the butter and egg mixture.
- Add the vanilla extract.
- In a separate bowl, sift together baking powder, flour, and cocoa powder. Add to wet mixture and mix well.
- Spoon brownie mixture into cake tin and smooth the top with a spatula.
- Bake for 35 minutes. Allow to cool in the tin for 10 minutes.
- Cut brownies 6 across and 4 down to yield 24 brownies.



SUSTAINABLE BROWNIE 'A'



CONVENTIONAL BROWNIE 'B'

Appendix C

Survey Questions:

A note to participants **PLEASE READ**: You are about to take part in a survey. Your answers to this survey are completely anonymous. If at any time during the process of being a participant in “The Brownie Experiment” you decide you no longer wish to take part in the study, you may indicate this to the researcher and leave. If you choose to leave the study your completed answers will not be used as data. If you have any questions or concerns regarding your participation in this study, you may contact Dr. Tarah Wright at tarah.wright@dal.ca or Mr. Nathan Ayer at nayer@dal.ca.

1. What is your year of study? 1st 2nd 3rd 4th 5th or beyond

2. What is your academic area of study?

3. Did you choose Brownie A or B? A B

4. What lead you to choose the brownie you chose? Please choose a number between 1 and 5 to represent the influence of each of the following on your decision (1 indicating it had no influence at all and 5 indicating it was a major contributor to your decision)

	No influence			Highly influential
Appearance of brownie.	1	2	3 4	5
Perceived taste.	1	2	3 4	5
Perceived benefits to personal health.	1	2	3 4	5
Perceived impact on the environment.	1	2	3 4	5
Financial Benefits for the Producers.	1	2	3 4	5
Other _____	1	2	3 4	5

5. To what degree did the labels on the brownies affect your choice? (please circle the most appropriate)

Had no Impact

Had some impact

Had great impact

6. If you had to pay for your brownie, and brownie 'A' cost more money than brownie 'B', how would that affect your decision (please check all that apply)?

- *It would not affect my decision*
- *I would have chosen brownie A over brownie B*
- *I would have chosen brownie B over brownie A*
- *Other* _____

7. Is there any other factor that affected your decision between brownies today that has not been mentioned above? Please explain...

Appendix D

What Makes Brownie A "Sustainable":

Ingredients:

Unsalted organic butter
Fair-trade organic caster sugar
Organic, local, free-range eggs
Fair-trade organic 85% cocoa dark chocolate
Organic pitted dates
Fair-trade organic vanilla extract
Fair-trade instant coffee granules
Baking powder
Organic plain flour
Organic cocoa powder
Icing sugar

We focused on including three main aspects of sustainability when baking the sample Brownie A: organic, fair-trade, and local.

Why Organic?

"An organic product is an agricultural product that has been certified as organic. A product can be certified if it is produced using the methods outlined by the Canadian Organic Standards" (Canadian Food Inspection Agency, 2015). Canadian Organic Standards provide the framework to "protect the environment, minimize soil degradation and erosion, decreasing pollution, optimizing biological productivity and promoting a sound state of health" (Canadian Food Inspection Agency, 2015).



Why Fair-Trade?



“Fair Trade producers take action to protect the environment in which they work and live. These measures include careful use of fertilizers and pesticides, crop rotation, and, in some cases, shade-grown production” (Fairtrade Canada, 2015).

The Fairtrade Canada certification ensures producers adhere to specific agrochemical, waste, soil, water, fire, genetically modified organisms, and energy standards (Fairtrade Canada, 2015).

Why Local?

The Canadian Food Inspection Agency (CFIA) is currently updating their definition of local. CFIA’s interim definition recognizes local as “food produced in the province or territory in which it is sold, or food sold across provincial borders within 50 km of the originating province or territory” (Canadian Food Inspection Agency, 2015). This study is defining local as food sourced within a 160km radius, which is consistent with the prominent 100-mile diet movement across North America.



Looking for more information?

Canadian Food Inspection Agency. (2015). *Fact sheet: Organic products in Canada.*

Retrieved from <http://www.inspection.gc.ca/food/organic-products/fact-sheet/eng/1389651477171/1389651725636>

Canadian Food Inspection Agency. (2015). *Canada Organic Regime: A certified choice.*

Retrieved from <http://www.inspection.gc.ca/food/organic-products/labelling-and-general-information/certified-choice/eng/1328082717777/1328082783032>

Fairtrade Canada. (2015). *Environment.* Retrieved from <http://fairtrade.ca/en/about-fairtrade/environment>

Canadian Food Inspection Agency. (2015). *Local food claims interim policy.*

Retrieved from <http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/origin/local-food-claims/eng/1368135927256/1368136146333>

Appendix E

Chose Brownie A	Chose Brownie A and asked for more information	Chose Brownie B	Chose Brownie B and asked for more information

Appendix F

ENVIRONMENTAL PROGRAMMES

FACULTY OF SCIENCE

DALHOUSIE UNIVERSITY

APPLICATION FOR ETHICS REVIEW OF RESEARCH INVOLVING HUMAN PARTICIPANTS

UNDERGRADUATE THESES AND IN NON-THESIS COURSE PROJECTS

GENERAL INFORMATION

1. **Title of Project:** "The Brownie Experiment: An Analysis of Sustainable Labeling and its Effect on Choice" - possible option

2. **Faculty Supervisor(s)**
Dr. Tarah Wright
Tarah.Wright@dal.ca

Department
Environmental Science

e-mail:

3. **Student Investigator(s)**
Number:

Department

e-mail:

Local Telephone

Célyna Arnold	Neuroscience and Environmental Sustainability and Society	c.arnold@dal.ca	(902) 266-5120
Emily Cantwell	Sociology and Environmental Sustainability and Society	em843428@dal.ca	(902) 497-0033
Jeannine Jure	Management and Environmental Sustainability and Society	jjure@dal.ca	(416) 884 - 5873
Paige Marvel	Environmental Science	paige.marvel@gmail.com	(604) 803 - 8893
Devon Matthews	International Development Studies	devmat@dal.ca	(902) 989 - 0147
Cole Grabinsky			

4. **Level of Project:**
Non-thesis Course Project [] Undergraduate [] Graduate Specify course and number:
ENVS/SUST 3502: Campus as a Living Lab
5. a. **Indicate the anticipated commencement date for this project:** March 15th, 2015
- b. **Indicate the anticipated completion date for this project:** April 12th, 2015

SUMMARY OF PROPOSED RESEARCH

1. Purpose and Rationale for Proposed Research

Briefly describe the purpose (objectives) and rationale of the proposed project and include any hypothesis (es)/research questions to be investigated.

The purpose of our proposed project is to understand how food-labeling influences the choices that students make about food on Dalhousie's campus. Our objective is to gain insight into how student's food decisions are made in regard to local, organic and fair trade products that we consider to be more sustainable choices.

A hypothesis we have is that students are not choosing sustainable options because of financial restraints rather than moral restraints.

2. Methodology/Procedures

a. Which of the following procedures will be used? Provide a copy of all materials to be used in this study.

- [] Survey(s) or questionnaire(s) (mail-back)
- [] Survey(s) or questionnaire(s) (in person)
- [] Computer-administered task(s) or survey(s)]
- [] Interview(s) (in person)
- [] Interview(s) (by telephone)
- [] Focus group(s)
- [] Audio taping
- [] Videotaping
- [] Analysis of secondary data (no involvement with human participants)

Unobtrusive observations

Other, specify _____

- b. **Provide a brief, sequential description of the procedures to be used in this study. For studies involving multiple procedures or sessions, the use of a flow chart is recommended.**

The procedure we intend to use is a questionnaire to collect data about how food-labeling influences the choices that students make about food.

3. **Participants Involved in the Study**

- a. **Indicate who will be recruited as potential participants in this study.**

Dalhousie Participants: Undergraduate students
 Graduate students
 Faculty and/or staff

Non-Dal Participants: Children
 Adolescents
 Adults
 Seniors
 Persons in Institutional Settings (e.g. Nursing Homes, Correctional Facilities)

Other (specify) _____

- b. **Describe the potential participants in this study including group affiliation, gender, age range and any other special characteristics. If only one gender is to be recruited, provide a justification for this.**

Potential participants of this study are Dalhousie students who eat in the residence halls Risley, Shireff and Howe on Dalhousie's Studley campus. As the location of this study is in residence buildings at Dalhousie the demographic will be primarily composed on first year students at Dalhousie. Individuals that are not Dalhousie University students will be excluded from the study.

- c. **How many participants are expected to be involved in this study?**

Our sample size is expected to have 312 people. The breakdown of this is expected to be 134 from Howe Hall, 94 from Risley Hall, and 84 for Shirreff Hall.

4. **Recruitment Process and Study Location**

- a. **From what source(s) will the potential participants be recruited?**

- Dalhousie University undergraduate and/or graduate classes
- Other Dalhousie sources (specify) Howe Hall, Risley Hall, and Shirreff Hall
- Local School Boards
- Halifax Community
- Agencies
- Businesses, Industries, Professions
- Health care settings, nursing homes, correctional facilities, etc.
- Other, specify (e.g. mailing lists) _____

d. Identify who will recruit potential participants and describe the recruitment process.

Provide a copy of any materials to be used for recruitment (e.g. posters(s), flyers, advertisement(s), letter(s), telephone and other verbal scripts).

For our project we will make sustainable brownies that will be identical in size, appearance, and be of no cost to the students. The only difference between the two will be labeling of the brownies 'Brownie A' and 'Brownie B'. 'Brownie A' will be labeled 'sustainable' and 'Brownie B' will be labeled 'conventional'. We will set up a table with both brownies labeled differently each night in three residence buildings, Howe Hall, Risley Hall and Sheriff Hall. After the student chooses/eats the brownie we will use a verbal script to have them fill out a survey asking them about what influenced their decision.

5. Compensation of Participants

Will participants receive compensation (financial or otherwise) for participation? Yes

No

If **Yes**, provide details:

Participants will receive a brownie as their incentive and compensation for their participation in this study.

6. Feedback to Participants

Briefly describe the plans for provision of feedback and attach a copy of the feedback letter to be used. Wherever possible, written feedback should be provided to study participants including a statement of appreciation, details about the purpose and predictions of the study, contact information for the researchers, and the ethics review and clearance statement.

Note: When available, a copy of an executive summary of the study outcomes also should be provided to participants.

POTENTIAL BENEFITS FROM THE STUDY

1. Identify and describe any known or anticipated direct benefits to the participants from their involvement in the project.

The students who are involved in our project will receive the direct benefit of eating a brownie. They can also feel good knowing that they helped participate in this useful study.

2. Identify and describe any known or anticipated benefits to society from this study.

One anticipated benefit to society from on study is that it could provide insight into how student's food decisions on campus are made on a larger basis.

POTENTIAL RISKS TO PARTICIPANTS FROM THE STUDY

1. For each procedure used in this study, provide a description of any known or anticipated risks/stressors to the participants. Consider physiological, psychological, emotional, social, economic, legal, etc. risks/stressors

No known or anticipated risks
Explain why no risks are anticipated:

Minimal risk
Description of risks: As people will be eating food, there is the potential that someone could experience an allergic reaction with one of the ingredients in the recipe. Another risk is that the people might experience slight discomfort if they do not like the taste of the brownie.

Greater than minimal risk
Description of risks:

2. Describe the procedures or safeguards in place to protect the physical and psychological health of the participants in light of the risks/stresses identified in Question 1.

To minimize this risk we will have sheets available with a print out of the ingredients used.

INFORMED CONSENT PROCESS

Refer to: <http://pre.ethics.gc.ca/english/policystatement/section2.cfm>

- 1. What process will be used to inform the potential participants about the study details and to obtain their consent for participation?**

- Information letter with written consent form; provide a copy
 Information letter with verbal consent; provide a copy
 Information/cover letter; provide a copy
 Other (specify) _____

- 2. If written consent cannot be obtained from the potential participants, provide a justification.**

ANONYMITY OF PARTICIPANTS AND CONFIDENTIALITY OF DATA

1. Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the research and in the release of the findings.

As our research does not need demographic data other than their year of study we will not be asking for it. This will ensure the anonymity of all Dalhousie student participants. Our data will remain anonymous during the research and in the release of the findings.

2. Describe the procedures for securing written records, questionnaires, video/audio tapes and electronic data, etc.

Written records will be in a secure folder and disposed of upon completion of the study. This information will not be shared outside of the group, and our mentor.

3. Indicate how long the data will be securely stored, the storage location, and the method to be used for final disposition of the data.

Paper Records

Confidential shredding after _____ years

Data will be retained indefinitely in a secure location

Data will be retained until completion of specific course (April 12, 2015).

Audio/Video Recordings

Erasing of audio/video tapes after _____ years

Data will be retained indefinitely in a secure location

Data will be retained until completion of specific course.

Electronic Data

Erasing of electronic data after _____ years

Data will be retained indefinitely in a secure location

Data will be retained until completion of specific course.

Other _____
(Provide details on type, retention period and final disposition, if applicable)

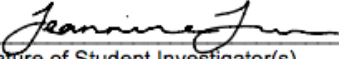
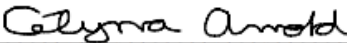

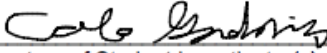
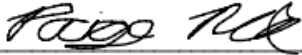
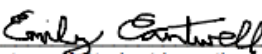
Specify storage location: A secure folder

ATTACHMENTS

Please **check** below all appendices that are attached as part of your application package:

- Recruitment Materials:** A copy of any poster(s), flyer(s), advertisement(s), letter(s), telephone or other verbal script(s) used to recruit/gain access to participants.
- Information Letter and Consent Form(s).** Used in studies involving interaction with participants (e.g. interviews, testing, etc.)
- Information/Cover Letter(s).** Used in studies involving surveys or questionnaires.

- [] Parent Information Letter and Permission Form for studies involving minors.
- [✓] **Materials:** A copy of all survey(s), questionnaire(s), interview questions, interview themes/sample questions for open-ended interviews, focus group questions, or any standardized tests used to collect data.

SIGNATURES OF RESEARCHERS	
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
_____ Signature of Student Investigator(s)	_____ Date

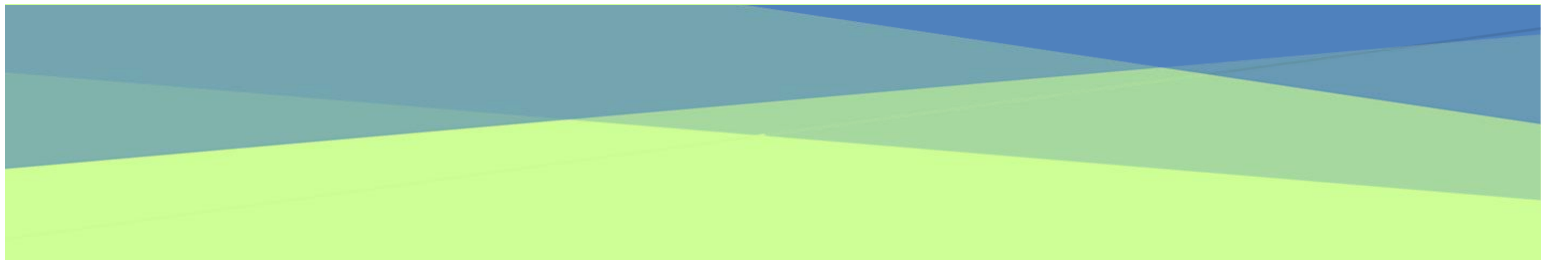
FOR ENVIRONMENTAL PROGRAMMES USE ONLY:

Ethics proposal been checked for eligibility according to the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans

Signature _____ Date _____

Appendix G

Our original project proposal has been included on the following page 35-63.



THE BROWNIE EXPERIMENT:

An Analysis of Sustainable Labelling and Its Effect on Choice.

Group Chico Mendes Cole Grabinsky - Community Design and Sustainability, Devon Matthews - International Development Studies and Sustainability, Jeannine Jure - Management and Sustainability, Célyna Arnold - Environmental Science, Emily Cantwell - Sociology and Sustainability and Paige Marvel - Environmental Science.

Table of Contents

Submitted on February 26, 2015

Project Definition.....	2
Background and Rational	3
Research Methods	5
Sample Population	5
Experimental Design.....	5
Experimental Conduct.....	6
Researcher Protocol	7
Data Collection.....	7
Data Analysis	7
Delimitations and Limitations.....	8
Ethics.....	8
Schedule.....	8
Budget.....	8
Deliverables and Communication Plan.....	9
References.....	10
Appendices	12
Appendix A- Labels	12
Appendix B-Survey	13
Appendix C-Ingredients Lists	15
Appendix D- Investigator Tally Sheet	17
Appendix E- Ethics Review Form	18
Appendix F- Schedule	25
Appendix G- Budget.....	26
Appendix H-DSUSO Funding Application	28

Project Definition

Every day, people make choices about the food they eat and these choices have consequences for sustainability. People’s food consumption patterns and the intensification

of agricultural practices have resulted in growing ecological damages around the world (Vanhonacker, Van Loo, Gellynck, and Verbeke, 2013). In industrialized nations, it is estimated that around 25 percent of the emissions we produce can be linked to the foods we eat (Czarnezki, 2011). Food consumption is one of the largest greenhouse gas emitting activities and this has serious ramifications for global climate change (Carlsson-Kanyama, Ekström, and Shanahan, 2003). Decision-making around food is therefore greatly important, as climate change has become one of the most pressing environmental issues of today.

Research has shown that dietary decisions made at the household and individual level can make a difference in reducing environmental harms associated with food consumption (Campbell-Arvai, Arvai, and Kalof, 2012). Many countries, including the European Union, the United States, and Canada, have adopted certification and labelling standards to provide consumers with more sustainable food options. Organic food labelling programs are the most widespread, however carbon labelling and environmental life-cycle assessment programs for food are on the rise (Czarnezki, 2011). Labelling a product for its environmental sustainability is often referred to as 'eco-labelling' and this is increasingly being used as a guide to encourage consumers to make environmentally responsible decisions.

The purpose of this research project is to understand how students living in residence at Dalhousie University respond to eco-labelling strategies. We hope to identify if eco-labelling best encourages sustainable food choices. As a signatory of the Talloires Declaration, Dalhousie University has made a commitment to educate for environmentally responsible citizenship. Dalhousie University therefore has the responsibility to provide education for food choices made on campus and ensure that students are best equipped to make sustainable food decisions. Understanding how food labelling influences food choices will allow Dalhousie to better promote sustainable options on campus and ultimately empower students to make better decisions regarding food.

Through an explanatory sequential mixed methods research approach, we plan to test student food choices by having them make a choice between two brownies while observing their actions before the choice, and surveying their perceptions after they have eaten it. Brownie A will be labelled 'sustainable' using ingredients that are organic, fair trade, or local. Brownie B will be presented in the exact same way, except it will be labelled 'conventional'. This study will use Fairtrade Canada and the Canadian Organic Regime standards for ingredients. Local ingredients will be sourced from a 160km radius, which is consistent with the 100-mile diet movement (Smith and Mackinnon, 2007) prominent across North America. We will be using these 'sustainable' and 'conventional' labels to see how students are persuaded or dissuaded from selecting the sustainable option. The brownies will be provided at no cost to students who wish to participate, however we will explore cost as a barrier to sustainable food decisions in the survey.

The scope of the 'Brownie Experiment' will be limited to Dalhousie University students living in residence buildings located on Studley Campus, Halifax Nova Scotia. Howe Hall, Risley Hall, and Shirreff Hall are the three residence buildings on Studley Campus that will be included in this study. We will test the 'sustainable' and 'conventional' brownie labels over three different nights at these residences. Student brownie choices will be documented and we will provide students with paper surveys to record additional

information about their choice. In this way, we hope to gather both quantitative and qualitative data about student perceptions of sustainable food.

The results from this research project could be valuable for Derrick Hines who is the Food Service Director at Dalhousie. This research could be useful in creating a standard for sustainable food labelling in residence cafeterias and across campus. Our research findings could be of interest to Rochelle Owen, Director of the Office of Sustainability, who is looking to improve sustainability on campus and among the student body. If an eco-labelling system was adopted for all food on campus, it would allow Dalhousie to become a leader for sustainability in food and better meet the needs of its students.

Background and Rational

In today's world, there is an acute awareness that the environment is suffering greatly at the hands of man-made pollution, emissions and degradation. While there are innumerable changes that human society needs to implement in order to see decreasing rates of environmental degradation and climate change, no area is more relevant to more people on the planet than the changes we need to make to the way we eat. These decisions impact our daily lives, regardless of our geographic location or economic status. As Czarnecki (2011) points out, the last decade has seen many popular public books and film such as Michael Pollan's "The Omnivore's Dilemma" and the documentary "Food Inc." that have challenged our conventional views on how we produce, transport, and consume food (p.2). According to Czarnecki (2011) and countless others, consumers' choices regarding the food that they eat contribute greatly to "the climate crisis, cause species loss, impair water and air quality, and accelerate land use degradation" (p.2). Vlaeminck, Jiang and Vranken (2014) argue that "food consumption is one of the most important areas to improve environmental sustainability since it is responsible for one third of a household's total environmental impact" (p.180). In fact, food consumption contributes between twenty and thirty percent of "the total environmental impact in the Western world"; it is therefore extremely critical to examine how people choose to consume food and adapt policies and procedures to encourage more sustainable consumptive behavior (Tobler, Visschers & Siegrist, 2011).

Due to increasing awareness of progressing environmental issues, Brecard, Hlaimi, Lucas, Perraudeau and Salladarre (2009) as well as Sporleder, Kayser, Friedrich, and Theuvsen (2014) indicate that there is an ever-increasing and robust market for sustainable goods. While the definition of what constitutes sustainable food is flexible and largely undefined, for the purpose of our study we have referred to the definition provided by the Sustainable Agriculture Initiative (2013) which reads "sustainable agriculture is a productive, competitive and efficient way to produce safe agricultural products, while at the same time protecting and improving the natural environment and social/economic conditions of local communities" (as cited in Sporleder et al., 2014, p.62). This is important because our study integrates aspects of both environmental and social sustainability, which is less prominent in the literature than aspects of only environmental sustainability.

This project aims to analyze how eco-labelling on brownie samples impacts student choice at Dalhousie University Studley campus. According to Grunert, Hieke, and Wills

(2014), there are an estimated 432 labelling methods in 246 countries around the world that dictate food and beverage sustainability standards. However, it is still largely unclear whether or not eco-labelling has a positive impact on consumer behaviour. Our experiment aims to uncover trends as to *why* students choose to consume either the sustainable or conventional brownie sample when given the chance to make this decision without cost being a factor in their decision making process. There are two reasons why we decided not to involve economic variables in our study. First, there is already a substantial body of literature that suggests that increased cost effects consumers' willingness to purchase a sustainable product (eg. Brecard et al., 2009; Sporleder et al., 2014; Van Loo, Caputo, Nayga & Verbeke, 2014). Secondly, we are concerned that by involving an economic variable, we will likely be unable to get to the root of what drives decision making in relation to eco-labeling; we are aware that the majority of students will be unwilling to pay to have a small sample of brownie. We have, however incorporated an aspect of our experiment that will allow us to see the difference between student values surrounding food choice and willingness to pay. This will be valuable data as there are numerous studies that indicate that there is a drastic disparity between consumer's ethics and values regarding food and their willingness to pay (Brecard et al., 2009; Grunert et al., 2014; Vlaeminck et al., 2014; Rokka & Uusitalo, 2008). Sporleder et al., (2014) terms this the "attitude-behavior gap" (p. 64) and argues that this is, at times, the biggest reason why consumers either do, or do not choose to consume sustainable food products. For the purpose of this study we will primarily be analyzing "the role of environmental morale and environmental motivation" in individual student behaviour regarding sustainable food consumption (Frey & Stutzer, 2006, p.1).

Frey and Stutzer (2006) argue that there are four different factors that go into a consumer's decision to choose sustainable products "altruism [both pure and impure], social norms and reciprocal fairness, internalized norms, and intrinsic motivation," (p.5-6) and that frequently a combination of these factors effect an individual simultaneously. An area of interest that we are particularly interested in is testing if students who choose the sustainable brownie do so because of concerns regarding consuming food that they perceive to be beneficial to their personal health rather than to environmental sustainability. Misra (2007) found that, when testing undergraduate students, there was very little concern with nutritional health labelling and information. We are interested in evaluating whether this is because students are more concerned with environmental sustainability or because they are not influenced by labelling.

There has been a tested connection between the level of personal "environmental morale" (Frey & Stutzer, 2006, p.8) that one has, and the choices that one makes concerning food. It has also been shown that there are numerous ways to change consumer behaviour without changing "environmental morale" (Frey & Stutzer, 2006, p. 8); for example instituting positive incentives outside of ethics based incentives can make those disinterested in being environmentally friendly more likely to choose sustainable food products (Frey & Stutzer, 2006). Previous studies with similar demographics have indicated that roughly half of the student population possessed knowledge regarding the ethics of sustainable food and that this translated into a sixty-five percent response indicating that they would prefer sustainable food options on campus (Dahm, Samonte, & Shows, 2009, p.195). If studies – such as "The Brownie Experiment" – are able to discover that there is a significant base of "environmental morale," (Frey & Stutzer, 2006, p. 8) or

conversely, a significant lack thereof within the student population at Dalhousie, the results of this data could inform strategic changes to food labelling. Thus, focusing on consumer behaviour is an important area of focus, and relevant to the Dalhousie community.

Research Methods

Sample Population

The population in consideration for this experiment is students that dine at Howe Hall, Risley Hall, and Shirreff Hall at Dalhousie University. The demographic of the study will thus be composed of primarily first year students by nature of residence populations at Dalhousie. There will however be the opportunity for upper year students to be involved in the study. Their participation will be evaluated by means of a question in the survey prompting the participant to identify their year of study. Individuals that are not Dalhousie University students will be excluded from the study. There are 1646 total residents in these three residences: 716 in Howe Hall, 490 in Risley Hall, and 440 in Shirreff Hall. It is desired for the sampling to be proportional to the population of each residence; therefore the sample must be composed of 43% Howe Hall students, 30% Risley Hall students, and 27% Shirreff Hall students. Based on a 95% confidence interval, the sample size should be 312 students. Of that sample, 134 will be from Howe, 94 will be from Risley, and 84 will be from Shirreff. Sampling will be conducted by a non-probabilistic method. Intercept/convenience sampling will be used in each residence hall until the quota for the sample size is met. Although this introduces some bias to the sample, it is the only feasible way to sample this experiment due to time, monetary, and information restraints. The hours of the day for which sampling will occur have not yet been finalized, but will likely be for minimum 2 hours in the evening for each sampling event.

Experimental Design

The experiment will be conducted in main foyer areas of Howe Hall, Shirreff Hall, and Risley Hall residences at Dalhousie University. The data collection will take place on three consecutive nights, at a different one of the above residences each night. In this way, there is little concern for duplicate participants because it can be assumed that a student will likely eat at the same residence hall each day at a given time (e.g. Risley Hall at 6:00pm every night). A plain, non-descript table will be set up in an area where there is a moderate amount of foot traffic. The table will be clear apart from two identical neutral-coloured plates each displaying an identical quantity of brownies. The two brownie displays will appear identical in every way. Each plate will bear a single label written on white card. One label will read the text "CONVENTIONAL" and the other label will read the text "SUSTAINABLE" (See Appendix A). All appearances of the display will be neutral-coloured and identical in size, shape, and symmetry. No visual cues will be present to influence the choice of the participant. An additional small table or area will be set aside on which printed surveys will be placed for participants to complete following brownie selection

(see Appendix B). Upon completion of the survey, a box with a slot will be present for the participant to place their completed survey.

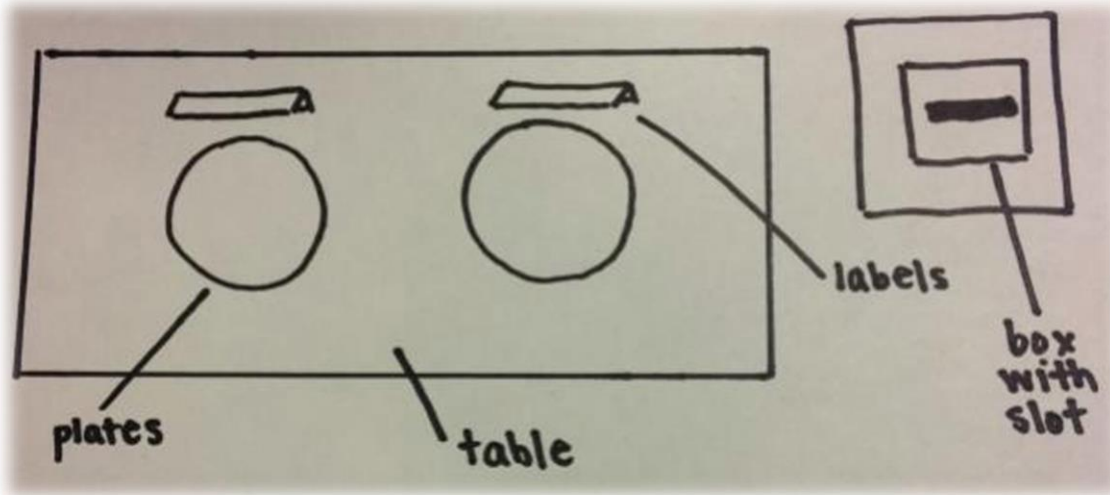


Fig. 1. Appearance of experimental set up for data collection including table, two plates, labels, and box with slot. Placement of researchers, participants, and brownies is not shown.

Experimental Conduct

Student researchers will be stationed by the table and approaching students that pass by to encourage participation in the study. The researchers will identify themselves as upper-year Dalhousie students that are conducting a research project for a class. No identifying information about what the class is or which faculty the students belong to will be provided so as not to influence the participant's decision. Participants will be informed that the study involves selecting a brownie from the two present choices followed by the completion of a short survey. At this point, participants will be left to make a decision between the two brownies. If the participant prompts the researchers about dietary concerns, what makes each brownie "conventional" or "sustainable", or requests any additional information, the researcher will give the participant a piece of paper with the ingredient list for the brownie in question (see Appendix C). After the participant has selected a brownie, the participant may take and eat their brownie and will be prompted to answer a short survey about the decision-making process (see Appendix B). In addition, researchers will keep a tally about which brownie was selected and whether that participant asked for more information given their brownie selection (see Appendix D).

Researcher Protocol

* Researchers will not give any identifying information about taking courses, having interest in, nor being in a faculty that has ties to the environment.

* No visual cues will be given to bias a participant's decision (e.g. gesturing to one of the brownies)

* Researchers will not give any descriptive information about the brownies or experiment unless prompted, at which time researchers may only give the sheet of paper and no additional verbal information.

* Researchers will make every effort to be objective conductors of the experiment and observers so as not to create any visual, audible, moral, or other bias in participant responses.

Data Collection

Quantitative data will be collected through a tally of how many participants chose the conventional brownie (without asking for further information), chose the conventional brownie and asked for further information, chose the sustainable brownie (without asking for further information), or chose the sustainable brownie and asked for further information (see Appendix D). Some quantitative data will also be obtained through questions on the survey that are not open-ended questions, or questions that have a finite number of answers (e.g. What is your program?). The survey will also provide qualitative information in the form of open-ended questions (see Appendix B). This mixed methods approach is useful because the quantitative data will be available for analysis using descriptive statistics; while qualitative data will allow for an understanding of what the thought processes and motivations are of participants in the brownie selection.

Data Analysis

Due to the integrated mixed methods approach of the experimental data collection, there will be a variety of available possibilities to analyze the data. The quantitative data from the tallies (see Appendix D) and some of the survey questions (see Appendix B) are candidates for analysis using descriptive statistics. For all categories in the tally data, two-tailed t-tests will be done to evaluate if a significant difference exists between the quantities selected of each. In addition, histograms with error bars will be created for these values to provide a visual representation of the data that can be statistically interpreted. All graphs will be created using Microsoft Excel. In addition, the percentages of tally categories will be of interest. For survey questions, t-tests will be done to compare between questions 2 & 3, 2 & 4, and 3 & 4. This analysis will be useful to identify what the motivating factors may be for the brownie selection. Also, for question 4 the mean of each ranking will be calculated. Finally, using a grounded a posteriori context sensitive scheme, qualitative analysis will be done on open-ended questions from the survey.

Delimitations and Limitations

This experiment faces an array of limitations. This experiment is a case study of a very specific population, meaning that it could prove challenging to create causal inferences about other situations based on the results of this experiment. In addition, the

method of a survey is limited because it can force participants into a certain response even if their desired response is not present. Also, a survey is unlike an interview in that participants are unable to clarify questions; therefore answers might not be as precise as desired. Another limitation is that there is a variety of traits subjects' display, regardless of attempts to sample a uniform demographic. Therefore, it is hard to create consistency in samples. Based on decisions of delimitations, the sample will also likely be composed of primarily first year students by nature of the fact that residence is mostly composed of those students. A final limitation is that we exclude individuals from the proposed sample population due to food preference. If an individual does not like brownies, they are unlikely to participate in our experiment. Delimitations of the study are that of Dalhousie University students, we will only sample from those on Studley Campus that are in Howe Hall, Shirreff Hall, or Risley Hall (depending on the given night) and walk past our table during the specified hours on the given sampling day.

Ethics

See Appendix E for our ethics application.

Schedule

See Appendix F for our detailed schedule.

Budget

The main component of our budget comes from the ingredients that will be purchased for baking. Based on a range of baking 4 to 6 batches, we have estimated the approximate costs for all ingredients needed. Where the ingredient is a minimal amount and already currently owned, we have allotted a cost of \$0. The second component in our budget is for the printing costs associated with labelling. The total amount budgeted for ingredients is calculated to be between the range of a minimum of \$146.59 and a maximum of \$195.21, depending on the number of batches we deem necessary and feasible. See Appendix G for a detailed budget breakdown.

A funding proposal has been submitted to DSUSO requesting a grant between \$147-196 in order to purchase the ingredients necessary to undertake our study, as well as to cover the costs of labelling signs for each brownie (see Appendix H).

Deliverables and Communication Plan

This project seeks to provide the director of food services, Derrick Hines, and the Director of the Office of Sustainability, Rochelle Owen, with an executive summary on our findings within understanding student perceptions surrounding sustainable food choices. With a better understanding of the influences on student food habits, the findings of our

study will hopefully help to further Dalhousie's commitment to making a more sustainable campus. This executive summary will aim to identify what type of labelling best influences sustainable food choices at Dalhousie, in order to utilize the findings to create more sustainable food options. Our experimental results have the potential to alter the way food labelling is implemented and understood, and our goal is for the study to result in useful information that can be adapted into future decisions surrounding food options on campus. The report will allow Dalhousie Food Services to be aware of the various influences and perceptions surrounding food labels and consumer choices in regards to fair-trade, local and organic food consumption.

The preliminary deliverables for this project will be communicated in two ways: the written report which will be posted on the Environmental Science Department website and the Pecha Kucha presentation to the class. This presentation will be delivered at the beginning of April to share the findings of our study with the students and instructors of the class. This presentation will comprise of a twenty-slide PowerPoint along with an oral presentation highlighting our research and findings. The written report will be delivered via e-mail to the Campus as a Living Laboratory Blackboard Learn page on Friday, April 17th, 2015. This report will include the summarized data gathered in our study, the literature review, final methods used, results and an analysis of these results with recommendations for Dalhousie's Food Services department. Visuals will accompany the report where necessary.

References

- Brécard, D., Hlaimi, B., Lucas, S., Perraudau, Y., Salladerré, F. (2009). Determinants of demand for green products: An application to eco-label demand for fish in Europe. *Ecological Economics*, 69, 115-125.
- Campbell-Arvai, V., Arvai, J., & Kalof, L. (2012). Motivating sustainable food choices: The role of nudges, value orientation, and information provision. *Environment and Behavior*, December, 1-23.
- Carlsson-Kanyama, A., Ekström, M. P., & Shanahan, H. (2003). Food and life cycle energy inputs: consequences of diet and ways to increase efficiency. *Ecological economics*, 44(2), 293-307.
- Czarnezki, J. J. (2011). The future of food eco-labeling: organic, carbon footprint, and environmental life-cycle analysis. *Stanford Environmental Law Journal*, 30(3), 1-49.
- Dahm, M., Samote, A., & Shows, A. (2009). Organic foods: Do eco-friendly attitudes predict eco-friendly behaviors. *Journal of American College Health*, 58(3), 195-202.
- Frey, B. S., & Stutzer, A. (2006). Environmental morale and motivation. *Available at SSRN 900370*. Retrieved from: <http://www.zora.uzh.ch/52245/1/iewwp288.pdf>
- Grunert, K. G., Hieke, S., Wills, J. (2014). Sustainability labels on food products: Consumer motivation, understanding and use. *Food Policy*, 44, 177-189. doi: 10.1016/j.foodpol.2013.12.001
- Misra, R. (2007). Knowledge, attitudes, and label use among college students. *Journal of the American Dietetic Association*, 107(12), 2130-2134.
- Rokka, J., and Uusitalo, L. (2008). Preference for green packaging in consumer product choices- Do consumers care? *International Journal of Consumer Studies*, 32, 516-525. doi: 10.1111/j.1470-6431.2008.00710.x

- Smith, A., & Mackinnon, J.B. (2007). *The 100-mile diet: A year of local eating*. Canada: Random House.
- Sporleder, E. M., Kayser, M., Friedrich, N., Theuvsen, L. (2014). Consumer preferences for sustainably produced bananas: A discrete choice experiment. *International Food and Agribusiness Management Review*, 17(1), 59-82.
- Tobler, C., Visschers, V., and Siegrist, M. (2011). Organic tomatoes versus canned beans: how do consumers assess the environmental friendliness of vegetables? *Environment and Behavior*, 43(5), 591-611. doi: 10.1177/0013916510372865
- Vanhonacker, F., Van Loo, E.,J., Gellynck, X., & Verbeke, W. (2013). Flemish consumer attitudes towards more sustainable food choices. *Appetite*, 62, 7-16.
- Vlaeminck, P., Jiang, T., Vranken, L. (2014). Food labeling and eco-friendly consumption: experimental evidence from a Belgian supermarket. *Ecological Economics*, 108, 180-190. doi: 10.1016/j.ecolecon.2014.10.019
- Young, W., Hwang, K., McDonald, S., & Oates, C. J. (2010). Sustainable consumption: green consumer behaviour when purchasing products. *Sustainable Development*, 18(1), 20-31. doi:10.1002/sd.394

[Appendices](#)

Appendix A

SUSTAINABLE BROWNIE 'A'

CONVENTIONAL BROWNIE 'B'

Appendix B

Survey Questions:

A note to participants PLEASE READ: You are about to take part in a survey. Your answers to this survey are completely anonymous. If at any time during the process of being a participant in “The Brownie Experiment” you decide you no longer wish to take part in the study, you may indicate this to the researcher and leave. If you choose to leave the study your completed answers will not be used as data. If you have any questions or concerns regarding your participation in this study, you may contact Dr. Tarah Wright at tarah.wright@dal.ca or Mr. Nathan Ayer at nayer@dal.ca.

1. What is your year of study? 1st 2nd 3rd 4th 5th or beyond

2. What is your academic area of study?

3. Did you choose Brownie A or B? A B

4. What lead you to choose the brownie you chose? Please choose a number between 1 and 5 to represent the influence of each of the following on your decision (1 indicating it had no influence at all and 5 indicating it was a major contributor to your decision)

	<i>No influence</i>				<i>Highly influential</i>
<i>Appearance of brownie.</i>	1	2	3	4	5
<i>Perceived taste.</i>	1	2	3	4	5
<i>Perceived benefits to personal health.</i>	1	2	3	4	5
<i>Perceived impact on the environment.</i>	1	2	3	4	5
<i>Socioeconomic implications for the Producers.</i>	1	2	3	4	5
<i>Other _____</i>	1	2	3	4	5

5. To what degree did the labels on the brownies affect your choice? (please circle the most appropriate)

- Had no Impact
- Had some impact
- Had great impact

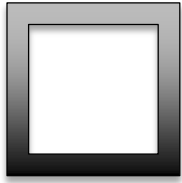
6. If you had to pay for your brownie, and brownie ‘A’ cost more money than brownie ‘B’, how would that affect your decision (please check all that apply)?

- *It would not affect my decision*

- *I would have chosen brownie A over brownie B*
- *I would have chosen brownie B over brownie A*
- *Other* _____

7. Is there any other factor that affected your decision between brownies today that has not been mentioned above? Please explain...

PLEASE CHECK THE BOX BELOW IF YOU AGREE HAVING YOUR ANONYMOUS RESPONSES USED IN THIS STUDY



THANK YOU,

“The Brownie Experiment” Team.

Appendix C

What Makes Brownie A “Sustainable”:

Ingredients:

Unsalted organic butter
Fair-trade organic caster sugar
Organic, local, free-range eggs
Fair-trade organic 85% cocoa dark chocolate
Organic pitted dates
Fair-trade organic vanilla extract
Fair-trade instant coffee granules
Baking powder
Organic plain flour
Organic cocoa powder
Icing sugar

We focused on including three main aspects of sustainability when baking the sample Brownie A: organic, fair-trade, and local.

Why Organic?

“An organic product is an agricultural product that has been certified as organic. A product can be certified if it is produced using methods outlined by the Canadian Organic Standards” (Canadian Inspection Agency, 2015).



the
Food

Canadian Organic Standards provide the framework to “protect the environment, minimize soil degradation and erosion, decreasing pollution, optimizing biological productivity and promoting a sound state of health” (Canadian Food Inspection Agency, 2015).

Why Fair-Trade?



“Fair Trade producers take action to protect the environment in which they work and live. These measures include careful use of fertilizers and pesticides, crop rotation, and, in some cases, shade-grown production” (Fairtrade Canada, 2015).

The Fairtrade Canada certification ensures producers adhere to specific agrochemical, waste, soil, water, fire, genetically modified organisms, and energy standards (Fairtrade Canada, 2015).

Why Local?

The Canadian Food Inspection Agency (CFIA) is updating their definition of local. CFIA's interim definition recognizes local as "food produced in the province or in which it is sold, or food sold across provincial borders 50 km of the originating province or territory" (Canadian Food Inspection Agency, 2015). This study is defining local as food sourced within a 160km radius, which is consistent with the prominent 100-mile diet movement across North America.



currently
territory
within

Looking for more information?

Canadian Food Inspection Agency. (2015). *Fact sheet: Organic products in Canada*. Retrieved from <http://www.inspection.gc.ca/food/organic-products/fact-sheet/eng/1389651477171/1389651725636>

Canadian Food Inspection Agency. (2015). *Canada Organic Regime: A certified choice*. Retrieved from <http://www.inspection.gc.ca/food/organic-products/labelling-and-general-information/certified-choice/eng/1328082717777/1328082783032>

Fairtrade Canada. (2015). *Environment*. Retrieved from <http://fairtrade.ca/en/about-fairtrade/environment>

Canadian Food Inspection Agency. (2015). *Local food claims interim policy*. Retrieved from <http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/origin/local-food-claims/eng/1368135927256/1368136146333>

Appendix D

Chose Brownie A	Chose Brownie A and asked for more information	Chose Brownie B	Chose Brownie B and asked for more information

Appendix E

ENVIRONMENTAL PROGRAMMES

FACULTY OF SCIENCE

DALHOUSIE UNIVERSITY

APPLICATION FOR ETHICS REVIEW OF RESEARCH INVOLVING HUMAN PARTICIPANTS

UNDERGRADUATE THESES AND IN NON-THESIS COURSE PROJECTS

GENERAL INFORMATION

1. **Title of Project:** "The Brownie Experiment: An Analysis of Sustainable Labeling and its Effect on Choice" - possible option

2. **Faculty Supervisor(s)** **Department** **e-mail:**
 Dr. Tarah Wright Environmental Science
 Tarah.Wright@dal.ca

3. Student Investigator(s) Number:	Department	e-mail:	Local Telephone
Célyna Arnold	Neuroscience and Environmental Sustainability and Society	<u>c.arnold@dal.ca</u>	(902) 266-5120
Emily Cantwell	Sociology and Environmental Sustainability and Society	<u>em843428@dal.ca</u>	(902) 497-0033
Jeannine Jure	Management and Environmental Sustainability and Society	<u>jjure@dal.ca</u>	(416) 884 - 5873
Paige Marvel	Environmental Science	<u>paige.marvel@gmail.com</u>	(604) 803 - 8893
Devon Matthews	International Development Studies	<u>devmat@dal.ca</u>	(902) 989 - 0147
Cole Grabinsky			

4. **Level of Project:**

Non-thesis Course Project [] Undergraduate [] Graduate Specify course and number:
ENVS/SUST 3502: Campus as a Living Lab

5. a. Indicate the anticipated commencement date for this project: March 15th, 2015
- b. Indicate the anticipated completion date for this project: April 12th, 2015

SUMMARY OF PROPOSED RESEARCH

1. Purpose and Rationale for Proposed Research

Briefly describe the purpose (objectives) and rationale of the proposed project and include any hypothesis (es)/research questions to be investigated.

The purpose of our proposed project is to understand how food-labeling influences the choices that students make about food on Dalhousie's campus. Our objective is to gain insight into how student's food decisions are made in regard to local, organic and fair trade products that we consider to be more sustainable choices.

A hypothesis we have is that students are not choosing sustainable options because of financial restraints rather than moral restraints.

3. Methodology/Procedures

- b. Which of the following procedures will be used? Provide a copy of all materials to be used in this study.

[] Survey(s) or questionnaire(s) (mail-back)

[] Survey(s) or questionnaire(s) (in person)

[] Computer-administered task(s) or survey(s)]

[] Interview(s) (in person)

[] Interview(s) (by telephone)

[] Focus group(s)

[] Audio taping

[] Videotaping

[] Analysis of secondary data (no involvement with human participants)

[] Unobtrusive observations

[] Other, specify _____

- b. Provide a brief, sequential description of the procedures to be used in this study. For studies involving multiple procedures or sessions, the use of a flow chart is recommended.

The procedure we intend to use is a questionnaire to collect data about how food-labeling influences the choices that students make about food.

3. Participants Involved in the Study

- e. Indicate who will be recruited as potential participants in this study.

- Dalhousie Participants: Undergraduate students
 Graduate students
 Faculty and/or staff
- Non-Dal Participants: Children
 Adolescents
 Adults
 Seniors
 Persons in Institutional Settings (e.g. Nursing Homes, Correctional Facilities)
- Other (specify) _____

- f. Describe the potential participants in this study including group affiliation, gender, age range and any other special characteristics. If only one gender is to be recruited, provide a justification for this.

Potential participants of this study are Dalhousie students who eat in the residence halls Risley, Shireff and Howe on Dalhousie's Studley campus. As the location of this study is in residence buildings at Dalhousie the demographic will be primarily composed on first year students at Dalhousie. Individuals that are not Dalhousie University students will be excluded from the study.

- g. How many participants are expected to be involved in this study?

Our sample size is expected to have 312 people. The breakdown of this is expected to be 134 from Howe Hall, 94 from Risley Hall, and 84 for Shirreff Hall.

4. Recruitment Process and Study Location

- a. From what source(s) will the potential participants be recruited?

- Dalhousie University undergraduate and/or graduate classes
 Other Dalhousie sources (specify) Howe Hall, Risley Hall, and Shirreff Hall
 Local School Boards

- Halifax Community
- Agencies
- Businesses, Industries, Professions
- Health care settings, nursing homes, correctional facilities, etc.
- Other, specify (e.g. mailing lists) _____

h. Identify who will recruit potential participants and describe the recruitment process.

Provide a copy of any materials to be used for recruitment (e.g. posters(s), flyers, advertisement(s), letter(s), telephone and other verbal scripts).

For our project we will make sustainable brownies that will be identical in size, appearance, and be of no cost to the students. The only difference between the two will be labeling of the brownies 'Brownie A' and 'Brownie B'. 'Brownie A' will be labeled 'sustainable' and 'Brownie B' will be labeled 'conventional'. We will set up a table with both brownies labeled differently each night in three residence buildings, Howe Hall, Risley Hall and Sheriff Hall. After the student chooses/eats the brownie we will use a verbal script to have them fill out a survey asking them about what influenced their decision.

5. Compensation of Participants

Will participants receive compensation (financial or otherwise) for participation? Yes

No

If **Yes**, provide details:

Participants will receive a brownie as their incentive and compensation for their participation in this study.

6. Feedback to Participants

Briefly describe the plans for provision of feedback and attach a copy of the feedback letter to be used. Wherever possible, written feedback should be provided to study participants including a statement of appreciation, details about the purpose and predictions of the study, contact information for the researchers, and the ethics review and clearance statement.

Note: When available, a copy of an executive summary of the study outcomes also should be provided to participants.

POTENTIAL BENEFITS FROM THE STUDY

1. Identify and describe any known or anticipated direct benefits to the participants from their involvement in the project.

The students who are involved in our project will receive the direct benefit of eating a brownie. They can also feel good knowing that they helped participate in this useful study.

2. Identify and describe any known or anticipated benefits to society from this study.

One anticipated benefit to society from on study is that it could provide insight into how student's food decisions on campus are made on a larger basis.

POTENTIAL RISKS TO PARTICIPANTS FROM THE STUDY

1. For each procedure used in this study, provide a description of any known or anticipated risks/stressors to the participants. Consider physiological, psychological, emotional, social, economic, legal, etc. risks/stressors

No known or anticipated risks
Explain why no risks are anticipated:

Minimal risk
Description of risks: As people will be eating food, there is the potential that someone could experience an allergic reaction with one of the ingredients in the recipe. Another risk is that the people might experience slight discomfort if they do not like the taste of the brownie.

Greater than minimal risk
Description of risks:

2. Describe the procedures or safeguards in place to protect the physical and psychological health of the participants in light of the risks/stresses identified in Question 1.

To minimize this risk we will have sheets available with a print out of the ingredients used.

INFORMED CONSENT PROCESS

Refer to: <http://pre.ethics.gc.ca/english/policystatement/section2.cfm>

- 1. What process will be used to inform the potential participants about the study details and to obtain their consent for participation?**

- Information letter with written consent form; provide a copy
 Information letter with verbal consent; provide a copy
 Information/cover letter; provide a copy
 Other (specify) _____

- 2. If written consent cannot be obtained from the potential participants, provide a justification.**

ANONYMITY OF PARTICIPANTS AND CONFIDENTIALITY OF DATA

3. Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the research and in the release of the findings.

As our research does not need demographic data other than their year of study we will not be asking for it. This will ensure the anonymity of all Dalhousie student participants. Our data will remain anonymous during the research and in the release of the findings.

4. Describe the procedures for securing written records, questionnaires, video/audio tapes and electronic data, etc.

Written records will be in a secure folder and disposed of upon completion of the study. This information will not be shared outside of the group, and our mentor.

3. Indicate how long the data will be securely stored, the storage location, and the method to be used for final disposition of the data.

Paper Records

Confidential shredding after _____ years

Data will be retained indefinitely in a secure location

Data will be retained until completion of specific course (April 12, 2015).

Audio/Video Recordings

Erasing of audio/video tapes after _____ years

Data will be retained indefinitely in a secure location

Data will be retained until completion of specific course.

Electronic Data

Erasing of electronic data after _____ years

Data will be retained indefinitely in a secure location

Data will be retained until completion of specific course.

Other _____
(Provide details on type, retention period and final disposition, if applicable)

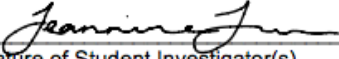
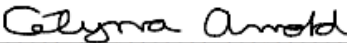

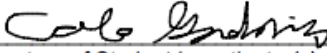
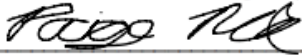
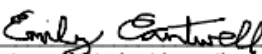
Specify storage location: A secure folder

ATTACHMENTS

Please **check** below all appendices that are attached as part of your application package:

- Recruitment Materials:** A copy of any poster(s), flyer(s), advertisement(s), letter(s), telephone or other verbal script(s) used to recruit/gain access to participants.
- Information Letter and Consent Form(s).** Used in studies involving interaction with participants (e.g. interviews, testing, etc.)
- Information/Cover Letter(s).** Used in studies involving surveys or questionnaires.

- [] Parent Information Letter and Permission Form for studies involving minors.
- [✓] **Materials:** A copy of all survey(s), questionnaire(s), interview questions, interview themes/sample questions for open-ended interviews, focus group questions, or any standardized tests used to collect data.

SIGNATURES OF RESEARCHERS	
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
 _____ Signature of Student Investigator(s)	_____ February 24, 2015 _____ Date
_____ Signature of Student Investigator(s)	_____ Date

FOR ENVIRONMENTAL PROGRAMMES USE ONLY:

Ethics proposal been checked for eligibility according to the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans

Signature _____ Date _____

Appendix F-Schedule

	Feb 22- 28	Mar 1 - 7	Mar 8- 14	Mar 15- 21	Mar 22- 28	Mar 29- Apr 4	Apr 5- 11	Apr 12- 18
Research Proposal (See divisions):								
Project Definition (Cole)								
BackGround and Rationale (Devon),								
Methods (Paige)								
Schedule (Célyna),								
Budget (Jeannine),								
Survey Questions (Célyna),								
Ingredients List (Jeannine)								
Deliverables and Comm. Plan (Jeannine)								
Contact Residences (Célyna)								
Ethics Proposal (Emily)								
Funding Proposal (Emily)								
Brownie Supply Shopping (Célyna)								
Brownie Baking (Devon + Célyna)								
Data Collection (All)								
Lit. Review Writing (Devon)								
Quantitative Data Analysis + Stats (Célyna)								
Qualitative (Survey) Data Analysis								
Final Report Writing:								
Executive Summary (Cole + Jeannine)								
Table of Contents (Devon)								
Introduction (Cole + Jeannine)								
Background and Lit Review (Célyna + Devon?)								
Research Methods Finalization (Paige?)								
Results Description (Paige + Emily)								
Results Figures (Célyna)								
Discussion (Célyna + Emily)								
Conclusion (Paige + Emily)								
Acknowledgements (Cole)								
Reference List (ALL)								

Appendices (ALL)	
Pecha Kucha Slides (Jeannine)	
Compilation of Final Report (Devon +Jeannine)	
Editing of Final Report (at least 3 of us...)	
Final Formatting (Célyna)	
Final Report Submission (Célyna)	

Appendix G

Ingredient Items: Sustainable Brownie	Cost (4 - 6 Batches):
115g Unsalted Organic Butter	$(\$7.99/454g) = \$7.99 - \$15.98$
170g Fair-trade Organic Caster Sugar	$(\$4.39/454g) = \$8.78 - \$13.17$
2 Local Organic Free Range Eggs	$(\$4.00/dozen) = \4.00
40 g Fair-trade Organic 85% Cocoa Dark Chocolate	$(\$3.99/100g) = \$7.98 - \$11.97$
55g Organic Pitted Dates	$(\$6.99/250g) = \$6.99 - \$13.98$
1 tsp. Fair-trade Organic Vanilla Extract	$(\$24.99/118ml) = \24.99
2 tsp. Fair-trade Instant Coffee Granules	--
1 tsp. Baking Powder	--
55g Organic Plain Flour	$(\$9.99/ 1.8 kg) = \9.99
55g Organic Cocoa Powder	$(\$12.29/200g) = \$12.29 - \$24.58$
Icing Sugar	= \$3.99
Total:	\$87.00 – \$122.65

<u>Ingredient Items:</u> <u>'Unsustainable Brownie'</u>	<u>Cost (4 - 6 Batches):</u>
115 g Unsalted Butter	$(\$3.99/454g) = \$3.99 - \$7.98$
170 g Caster Sugar	$(\$4.99/2kg) = 4.99$
2 Eggs	$(\$3.69/dozen) = \3.69
40 g 85% Cocoa Dark Chocolate	$(\$3.99/100g) = \$7.98 - \$11.97$
55g Pitted Dates	$(2.59/350g) = \$2.59$
1 tsp. Vanilla Extract	$(3.79/43ml) = \$3.79$
2 tsp. Instant Coffee Granules	= \$4.99
1 tsp. Baking Powder	--
55g Plain Flour	$(\$3.59/ 1kg) = \3.59
55g Cocoa Powder	$(\$4.99/250g) = \$4.99 - \$9.98$
Icing Sugar	= \$3.99
Total:	\$44.59 - \$57.56

<u>Labelling Costs</u>	
Printing/Lamination	\$15.00
TOTAL OF ALL COSTS:	<u>\$146.59 – \$195. 21</u>

Appendix H

February 24, 2015

Student Project Funding Proposal for Dalhousie Student Union Sustainability Office (DSUSO)

Project Title: The Brownie Experiment: An Analysis of Sustainable Labeling and It's Effect on Choice.

Goal: To better understand how students living in residence at Dalhousie can be guided by labeling to make more sustainable food choices on a daily basis.

Justification: We want to explore the influence that food labeling can have on influencing people's food choices in residences on campus. Dalhousie strives to increase the availability of sustainably caught, sustainably produced, local, third party certified, food on campus and our project will address issues around the food consumption on campus. Our study could provide insight into how student's food decisions on campus are made on a larger basis. The director of food services might be interested in this.

Rough Schedule:

March:

16 – Buy ingredients

17 – Bake brownies

18- First day of study at Risley Hall

19- Second day of study Howe Hall

20- Third day of study Shirriff Hall, by end of day have data collection completed

21 – Begin analysing the data

23- Work on finalizing the data analysis

April:

12 – Final report is due

Description:

The six members of our research team Chico Mendes are the people directly involved with 'doing' our project. The beneficiaries would be the students who live in residences. The director of food services might also be interested in this study. This is a project for our course ENV5/SUST 3502: Campus as a living lab. Our contact person is our professor Dr. Tarah Wright, her email is Tarah.Wright@dal.ca.

For the purposes of our project our idea of sustainable food is food that is organic, fair trade, and uses local ingredients. Our idea of unsustainable food is food that is, non-organic, industrial made with the use of pesticides, and does not use local ingredients. For our project we will make brownies that will be identical in size, appearance, and be of no cost to the students. The

only difference between the two will be labeling of the brownies 'Brownie A' and 'Brownie B'. 'Brownie A' will be 'sustainable' and 'Brownie B' will be unsustainable. We will set up a table with both brownies labeled differently each night in three residence buildings, Howe Hall, Risley Hall and Sheriff Hall. After the student chooses/eats the brownie we will have them fill out a survey asking them about what influenced their decision.

Budget:

We estimate that we will need between \$147 and \$196 depending on our baking range of 4-6 batches of brownies. We want to ensure that there is the possibility to choose either "Brownie A" or "Brownie B" for all students involved in this study. We will re-use uneaten brownies the following night of data collection.

Breakdown:

- Sustainable brownie: \$87.00 - \$122.65
- Unsustainable brownie: \$44.69 - \$57.56
- Printing/lamination costs(labels): \$15

Total = \$147 - \$196

Follow-up:

If funded we would communicate DSUSO funding in a one page summary after the interview. We would agree to submit a follow-up report detailing the successes and failures of the proposed initiative.