

An investigation into food-insecurity felt by undergraduate student living off campus attending  
Dalhousie's Studley Campus

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**DALHOUSIE**  
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## **Executive Summary:**

Our group surveyed and interviewed undergraduate students living off-campus who attend classes on the Studley campus at Dalhousie University in Nova Scotia. As a group, we developed questions based on a mixture of priorly done research and personal experience to analyze how food insecurity affects other students. Our research question was the following:

- 1) How does food insecurity affect off-campus undergraduate students who attend Dalhousie's Studley campus?
- 2) Is there a higher level of understanding on the issue of food insecurity from Dalhousie students who are completing a green degree as opposed to those who are not?

We chose to address not only the issue of food insecurity in relation to all students who participated but as well questioned if prior knowledge taught in sustainability or environmental science-based stems of academia had provided students with adequate knowledge to help them address or prevent their individual issues surrounding food insecurity. Some indications that food insecurity was a present issue on campus that we found after surveying 115 undergraduate students were that 95% of students saw a rise in groceries in recent months. Looking into where students shop for their groceries the trend mainly showed that the Atlantic Superstore was the primary retail location. 62 respondents identified using the Atlantic Superstore as their primary grocery store, while only 29 used Sobeys, and 13 students used Walmart. The rise in cost, and a clear indication that there are only three main sources for groceries, the rise in cost was seen to affect mental health in students with over 30 students both agreeing or somewhat agreeing food insecurity played a role in this. The trend also carried into physical health with 46 students agreeing and 31 students somewhat agreeing their physical health has been negatively affected by food insecurity.

Furthermore, we analyzed how food insecurity was being mitigated by the Dalhousie Government, or student-run initiatives that are helping combat the issue of food insecurity. Our survey results concluded that the most known and used asset on campus is the Loaded Ladle which provides students with free meals at a specific time during the week. Students also saw use in the Dalhousie Food Bank and student garden, but these initiatives were used more infrequently. Moving forward, Dalhousie could help these previously mentioned initiatives find more resources to provide more help to students. This could be done through funding specific programs, this has already started to be seen with ESS dinners, or more promotions as many students are also unaware of the help or are unaware if they are eligible. These helpful practices such as the Loaded Ladle help provide students with a healthy meal, as well as give

students a chance to give back to the community which is an overall sustainable practice to help mitigate food insecurity.

### **Introduction:**

Last year in 2022, Canada saw the largest Consumer Price Index (CPI) increase in 40 years (Statistics Canada, 2023). CPI rose about 6.8% on an annual average basis with Canadians feeling inflation impacts as transportation (+10.6%), food (+8.9%) and shelter (+6.8%) prices skyrocketed. In a 2022 article written by MacEwen & Butler of the Canadian Union of Public Employees (CUPE), they highlighted the issue of wages failing to keep up with inflation. They stated when wage increases do not match that of inflation, workers lose money- even if their paychecks seem more substantial. An estimated wage increases of over 8% would be needed for workers to receive a true pay raise. Further investigation into the breakdown of inflation, pointed to the easing of COVID-19 restrictions increasing the demand for crude oil while the uncertainty of its supply amid Russia's invasion of the Ukraine created the highest inflation point of energy to (+22.5%) (Statistics Canada, 2023). Unsurprisingly, Atlantic Canadians were most impacted by the energy increase, as fuel oil is more commonly used for heating homes in Atlantic Canada. While Canada's annual average % change for 2022 was 6.8%, Nova Scotia experienced a 7.5% annual average change in 2022, the third highest provincial increase in the country.

As prices for food purchased from stores rose 9.8% in 2022 (highest inflation rate since 1981), many Canadians experienced a need to alter their finances to account for these inflation prices. The supply of food had been impacted by multiple factors: extreme weather, supply chain disruptions, and high input costs. Because of this, food insecurity became an increasing concern among Canadians. Andersen et al. 1990 from the Life Science Research Office defined food insecurity as "the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways". While discussing food insecurity, it is important to differentiate this from hunger. Hunger is a subjective feeling whereas food insecurity is a socioeconomic measure used to describe certain households (Flores & Amiri, 2019). A household could be experiencing food insecurity, this does not mean that these individuals are necessarily experiencing a feeling of hunger. Hart 2009 explains the reasoning behind food insecurity stemming from two forms of 'multiple stressors'. The first being from sudden shock (ie. Floods, unemployment, drought, price increase, death) and the second being gradual changes (ie. Changes in delivery services, land degradation, social and economic marginalization). The baseline reasoning for experiencing food insecurity is seen within the in-balance between inflation and wage increases.

Food insecurity is associated with low income, low educational attainment, belonging to a racial or ethnic minority, renting a home, living in an urban environment, being a single parent, having a disabled household member, and maternal depression (Flores & Amiri, 2019). Moreover, households with children, veterans and military families, college students, members of the LGBTQ+ community, and immigrants have been identified to have an elevated risk of food insecurity. Identifying college and university students as a particularly vulnerable population to experiencing food insecurity is important when stakeholders make financial decisions which directly impact student's finances. Undergraduates are typically students straight out of high school and living on their own for the first time. Having to budget finances for living expenses (ie. Housing, food, hygiene necessities, etc) is a multifaceted task which college or university students are arbitrarily less experienced with. Undergraduate students participating in rental housing coupled with taking out student loans or a line of credit furthers this demographic into a vulnerable group for experiencing food insecurity (Fricke, 2018).

A previous study on food insecurity within college populations noted that food insecurity has negative results on the students. This is not only due to lack of financial resources, but due to inadequate cooking abilities, as well as a lack of transportation to grocery stores (Meza et al., 2019). Participants in this study reported feelings of stress, jealousy, hopelessness, and fear of failure as a result of experiencing food insecurity (Meza et al., 2019). These negative impacts cause students' grades and ability to attend school to drop where "students who had experienced severe FI [(Food Insecurity)] were nearly 15 times more likely to have failed courses and were 6 times more likely to have withdrawn or failed to register for more courses" (Silva et al., 2015). Meza et al. (2019) also recognized the role food plays in socializing in colleges and universities, be it going to restaurants for special occasions or having gatherings at residences. When students are impacted by food insecurity, they may feel barriers to socialization and the lack of participation may lead to a lack of community and negative self-image for the individual. Therefore, food has overall health, scholarly, and social implications that have been proven to show when an individual is put into a place of food insecurity, they suffer more than being hungry.

With the definition of food insecurity, we can begin to explain and rationalize why it is important to ensure students who attend post-secondary schools, such as Dalhousie University, are able to obtain and maintain an adequate healthy diet. This study will help identify the food insecurity issues on the Dalhousie University Studley campus by analyzing both internal and external factors such as University run food programs, meal preparation, and students' knowledge of their own eating habits and practices. Our study will consist of first off with a survey of a sample of the Dalhousie University Studley campus. When comparing our survey answers we will be able to obtain a general understanding of trends in relation to Dalhousie students' ability to combat their food insecurity. Some of the surveyed students will

be selected for interviews for a more in-depth understanding of personal instances where their food insecurity could be avoided, or in contrast when it is not avoidable. The research will then be gathered and organized to be developed into a paper and presentation in order to share our information with the class, University, and participants.

Furthermore, we are curious about the potential differences in the awareness and general knowledge of food insecurity among students completing a green degree (ie. Science, Arts & Social Science, Health, Community Design) and those who are not (ie Commerce, Management, Architecture and Planning). While there is no hard and fast definition of a 'green degree', similarly to a 'green job', it is typically considered to be those programs that solely focus on environmental and sustainability or considers it in the context of the main discipline (ie. Agriculture, Biology, Engineering, Policy, Economics, Energy, Law etc) (PromoLeaf, 2022). One of your research questions aims to investigate possible differences among the two types as to highlight potential education gaps which could aid all student on their financial journey. There is a growing importance in understanding the effects of food insecurity post pandemic as cost of living, groceries, as well as the price of gas have all seen a massive increase resulting in people having a higher cost of living (Kirshenbaum & Buhler, 2018). Although various factors from the COVID-19 pandemic have contributed to food insecurity, this study will not specifically consider these related factors. The proposed research is intended to help mitigate food insecurity, and the rise of undergraduate students who are being negatively affected by these issues by assessing the fundamental problems that the Dalhousie University students have in 2023.

The research questions being investigated in this study are:

- 1) How does food insecurity affect off-campus undergraduate students who attend Dalhousie's Studley campus?
- 2) Is there a higher level of understanding on the issue of food insecurity from Dalhousie students who are completing a green degree as opposed to those who are not?

### **Methods:**

#### **Study Design:**

This research was aimed towards undergraduate students who reside off-campus and attend classes on the Studley campus at Dalhousie University in Halifax, Nova Scotia, Canada. Individuals attending the Dalhousie University agricultural campus were omitted from this study due to physical barriers to accessing this campus. It was determined that for this research the target sample size would be

375 individuals as this was determined to be the minimum number of individuals to make have a representative sample with a 5% margin of error and a 95% confidence level. This 375 was based on Dalhousie university having a total of approximately 16, 002 undergraduate students. This number is an estimate as it was calculated in December 2022. After removing the number of undergraduate students that attended the agricultural campus and were enrolled in planning and architecture, the estimated total population was 15, 152 students. Planning and architecture students were not included in this count as they study primarily at the Sexton campus. Of this estimated 15, 152, it is unclear how many of these students are living off-campus compared to on-campus.

A survey was chosen as the sampling and data collection method for this study. A survey was chosen as it is a simple way to collect lots of data and can be made easily accessible and widespread. Choosing to conduct a survey also increased the anonymity of individuals responding to our survey. Food insecurity may be a sensitive subject to many individuals and this was important to be mindful of. There were also interviews conducted in order to obtain additional information, but these were to be used as an additional source of information and were not used as the main source for data collection. The survey for this study was created using an online platform called Jotforms. In the survey, which can be found in the appendix of this paper, there were two places where individuals had the option to give their email address. One option was to be contacted with the study's findings and the second was an option to be contacted for an interview. It was noted in the consent form on the survey that if individuals did choose to provide their email in either of the two spaces, it would compromise their privacy as their identity could be identified. Conducting a survey compared to other various research methods seemed most easily widespread as a QR code was able to be distributed and the survey took roughly 5 to 7 minutes to complete, making it low commitment to those who chose to fill it out. It is recognized, and supported by our results, that few people are interested in completing interviews; this is likely due to interviews being more time consuming and since the topic is one that is sensitive, it could feel uncomfortable for individuals to speak openly about their struggles with food security. The survey consisted of 30 questions, two of which were email submission spaces. The remaining 28 questions were made up of yes/no/unsure style questions, single and multiple selection questions, one ranking question, and one open-ended question.

### **Procedure:**

The survey used for this study was made public at approximately 4pm (AST) on March 9<sup>th</sup>, 2023, and was closed to the public at noon (AST) on March 16<sup>th</sup>, 2023. Posters containing the eligibility of the study and access to the survey via a QR code were put up throughout the Dalhousie Studley campus and at third-space locations. For this study, third-space locations are locations outside of school and home that individuals may frequent. 39 posters were put up around the Studley campus and this consisted of: 5

posters in the life science center (LSC), 2 posters in the James Dunn building, 5 posters in the chemistry building, 5 posters in the Killam Library, 18 posters put up between mens washrooms, computer science building, and the underground tunnels, and 4 posters in the Mona Campbell building. An additional 5 posters were put up in third party spaces which consisted of: 1 poster at Coburg Social, 1 poster and Noggins on the Corner, 1 poster at East Peak Climbing, 1 poster at Seven Bays Bouldering, and 1 poster at Glitter Bean Café. Between on- and off-campus locations, a total of 44 posters were put up. All posters were distributed between March 10, 2023, and March 13, 2023. To get additional results, a total of 41 faculty members were emailed attachments of the survey and asked to share the poster among their students. All emails were sent between March 9<sup>th</sup> and March 14<sup>th</sup>, 2023. The 41 members consisted of 25 commerce professors, 4 biology professors, 3 sustainability (SUST) professors, 2 health and human performance (HAHP) professors, 1 physics professor, 1 recreation and leisure professor, one management and sustainability professor, 1 environmental science professor (ENVS), one ENVS and SUST professor, 1 journalism professor, and 1 ENVS and GIS professor. Of the 41, only 9 confirmed they would share the poster. Additionally, the survey was shared via Kayleigh Makarucha's Instagram, as well as the Loaded Ladles Instagram stories to receive additional survey results. A Total of 115 survey responses were collected and a total of 5 interviews were conducted.

One main limitation in the methods of this research was due to the use of Jotform, which required a payment of \$40 to continue collecting data after 12pm on March 16, 2023. The research team decided to end the data collection early and begin data analysis instead of making a financial contribution to this research. Because of this, only 115 responses were collected, and it is likely this number could have been higher if the survey was public for a longer period of time. Because of this, the number of responses is less than the number of responses that would have been required to make the sample size representative. Results were analyzed using ArcGIS to compare variables to one another to determine relevance of one variable on another. Due to the findings being qualitative, no formal statistical tests were carried out.

## **Results**

We used two forms of sampling; a survey assessing the impact of rising food prices on undergraduate students, and a follow-up interview with volunteer participants addressing how they felt about food insecurity and its impacts, and their own proposed solutions. Our survey gathered 115 responses, 112 of which were undergraduate students at Dalhousie University. We found that 91 respondents did not identify as part of a visible minority, 19 students did identify as part of a visual minority and 5 respondents preferred not to answer. Figure. 1 displays survey responses to the question "Are you worried food will run out?", among minority and non-minority groups as well those who preferred not to answer.



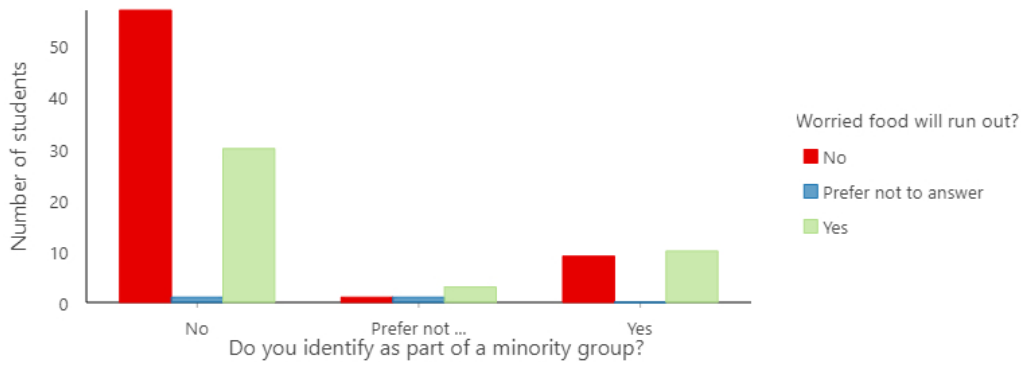
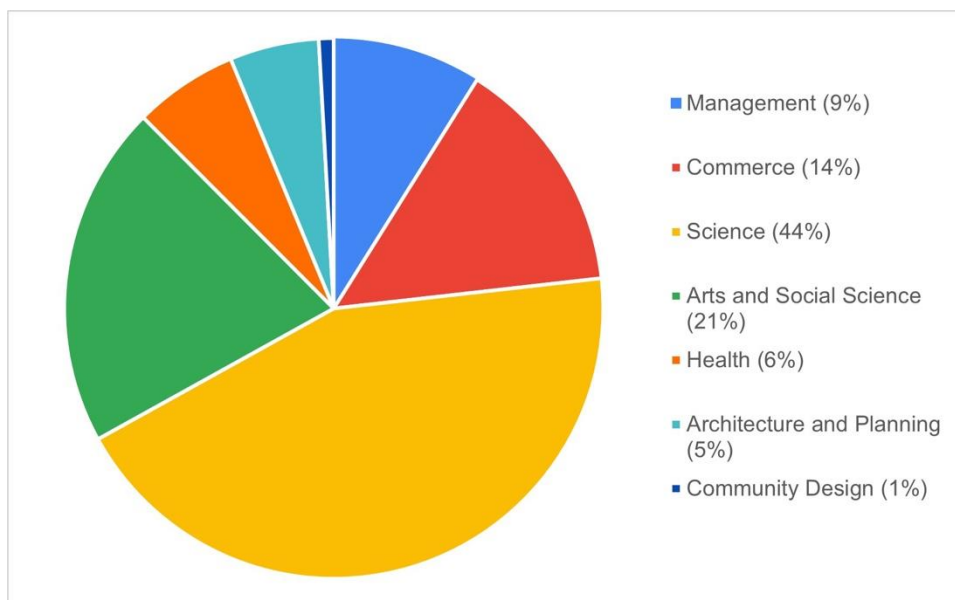


Figure 1, A bar graph detailing the survey responses to the question “Are you worried food will run out?” among minority and non-minority groups as well those who preferred not to answer. The number of student responses are indicated in the Y-axis and the exposure groups on the X-axis (non-minority, prefer not to answer, and minority). Graph created on ArcGIS, 2023.

We aimed to collect data from a wide variety of the faculties of undergraduates at Dalhousie University, however we saw the highest respondent rate was from the faculty of science, at 50 respondents. Following this were 24 respondents from arts and social sciences, 16 from commerce, 11 from management, 7 from architecture and design, and 7 from the faculty of health. Of the 115 respondents, 73 answered yes to having taken a sustainability or environmental course in their undergraduate studies, either at Dalhousie University or another academic institution, and the other 42 respondents stated they had not taken either of these course types.



*Figure 2*, Pie chart categorizing the proportion of responses by program. Legend indicates programs with their respective percentage of whole responses. Management (blue) at 9%, Commerce (red) at 14%, Science (yellow) at 44%, Arts and Social Science (green) at 21%, Health (orange) at 6%, Architecture and Planning (light blue) at 5%, Community Design (purple) at 1%. It was found that science students comprised the majority of our survey responses at 44%. Created using Microsoft Excel.

73 of the respondents stated they are currently living off campus, and of these 108 are renting an apartment/house/unit. We divided the Halifax peninsula and Dartmouth into 6 renting zones, as seen in *Figure 1*. 56 of the respondents reside in zone B, or Dalhousie Campus zone. The remaining zones in order of most to least respondents residing in them are as follows; zone A (south end, 24 respondents), zone C (downtown, 18 respondents), zone D (west end, 7 respondents), zone E (north end, 4 respondents), and zone F (Dartmouth, 1 respondent). We also received two “other” responses; one from Hammond's Plains and one from Waverly. The most common rent price range among respondents is \$701-\$1000, with 53% of the respondents selecting this option. 24% of respondents pay between \$501-\$700 monthly on rent, 17% pay more than \$1000, 0.8% of respondents pay less than \$500 and 5.2% are not renting. Of the respondents, 30 pay 100% of their rent using their own income, 12 pay more than 50%, 6 pay exactly 50%, 24 pay less than 50%, 40 pay 0% and 1 respondent identified they are not renting.

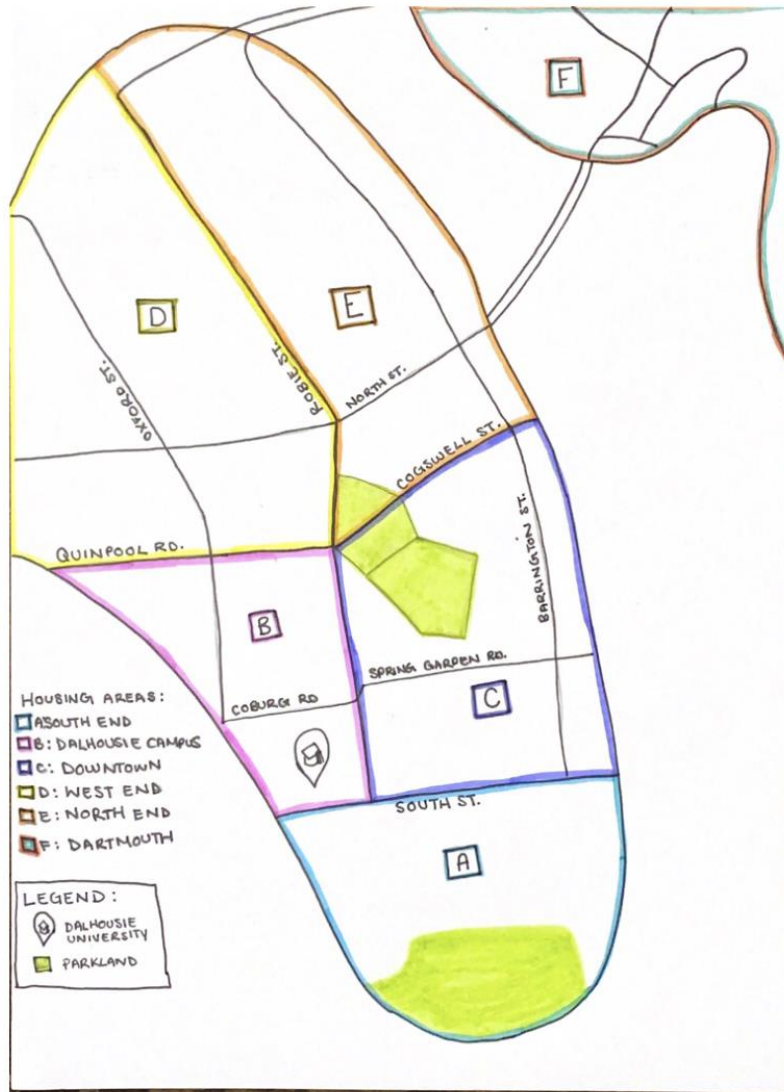


Figure 3, Map of renting zones on the 6 Halifax peninsula and Dartmouth used for the survey. Hand drawn on paper by Kayleigh Makarucha.

In the past 6 months, 110 respondents identified with seeing an overall increase in cost of groceries, 1 did not, and 2 were unsure. The most common average monthly cost of groceries identified was between \$151-\$250, with 40 respondents choosing this option. The next most common was \$251-\$350 with 36 respondents, then 17 respondents choosing more than \$350, and finally 13 respondents choosing \$51-\$150 on monthly groceries. Concerning how much of one's grocery bill is covered by one's own income, 59 respondents cover 100% of their grocery cost, 11 cover more than 50%, 4 cover exactly 50%, 23 cover less than 50% and 15 cover 0% of their grocery cost.

The most commonly identified grocery store that students buy most of their groceries at is Atlantic Superstore, with 62 respondents identifying this in their response. Sobeys was the second most commonly identified with 29 students listing it, then Walmart with 13 students, Petes Fruitique with 5, Costco with 2 and all the following were mentioned only once; DSU market, Dollar Store, No Frills, Gateway, Online, Local Source and Noggins.

Next, we asked respondents an 8-part question in which they must select if they have or have not experienced the statement from the start of the winter term until present day. The first statement was if they had worried food would run out, to which 67 said no and 43 said yes. The second statement was if they had not been able to afford a balanced meal; 61 said no and 49 said yes. Next, we asked if they had cut or skipped a meal due to cost, where 46 said not and 65 said yes. The fourth statement was if they had been hungry, but not eaten due to cost; 62 said no and 47 said yes. Next, we asked if students had altered their diet due to cost, where 36 said no and 72 said yes. The sixth statement was if they had compromised on desired groceries, where 14 identified they had not, versus 95 who had identified they have. The next statement was if they had taken fewer trips to the grocery store; 15 said no and 97 said yes to this. Finally, the last statement asked if they had gone an entire day without eating, where 81 said no and 31 said yes.

Our next set of questions focused on whether respondents' mental health has been impacted by their own experiences with food insecurity. When asked this, 33 respondents selected agree, 32 selected somewhat agree, 24 were neutral, 8 somewhat disagreed and 17 disagreed. When asked if their sleep has been impacted by their experiences with food insecurity, 74 said no, 38 said yes and 2 preferred not to answer. When asked if they have experienced increased stress due to their experiences with food insecurity, 24 said no, 69 said yes and 19 were unsure.

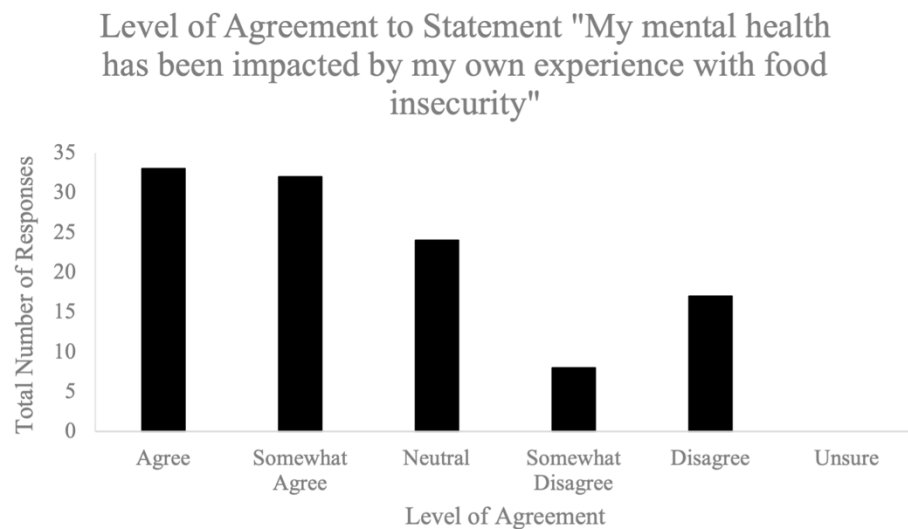


Figure 4. Bar graph showing undergraduate student responses on if they feel as though their mental health has been impacted by their own experience with food insecurity. Data collected March 2023 at Dalhousie University in Halifax, Nova Scotia, Canada

When asked if respondents felt their academic success has been impacted by their own experiences with food insecurity, 18 agreed that it has been impacted, 30 somewhat agreed, 18 were neutral, 13 somewhat disagreed and 28 disagreed, with 2 respondents being unsure.

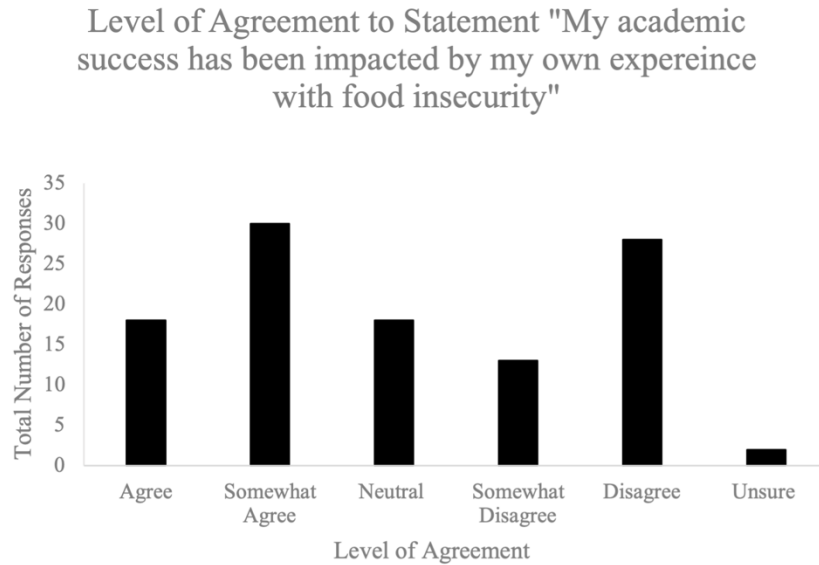
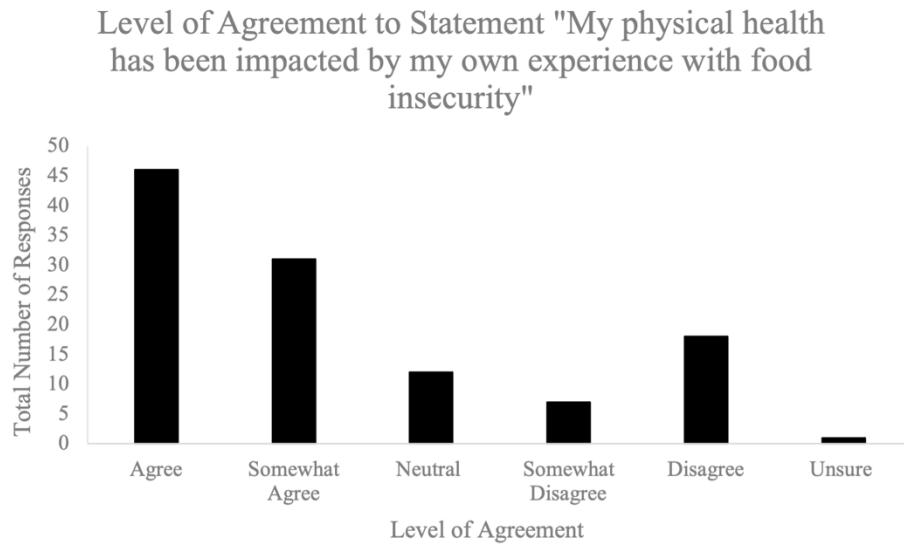


Figure 5. Bar graph showing undergraduate student responses on their level of agreement on if their academic success has been impacted by their own experience with food insecurity. Data collected March 2023 at Dalhousie University in Halifax, Nova Scotia, Canada.

When respondents were asked their level of agreement with the following; my physical health has been impacted by my own experience with food insecurity, 46 agreed, 31 somewhat agreed, 12 were neutral, 7 somewhat disagreed, 18 disagreed and 1 respondent was unsure.



*Figure 6.* Bar graph showing undergraduate student responses on their level of agreement if their physical health has been impacted by their own experience with food insecurity. Data collected March 2023 at Dalhousie University in Halifax, Nova Scotia, Canada

Next, we asked respondents to identify which food initiatives (allowing them to select multiple) they were currently aware of out of the following list; the Loaded Ladle, The Dalhousie Urban Garden, the Dalhousie Student Union (DSU) Farmers Market and the DSU Food Bank. Of this, 96 were aware of the Loaded Ladle, 80 were aware of the DSU farmers market, 57 were aware of the DSU food bank, 26 were aware of the Dalhousie urban garden, and 15 people identified they were not aware of any of these food related initiatives.

Finally, we had students rank each food initiative based on how important it was to them and their own well-being (how often they used it, how much they enjoyed the service) on a scale of 1 to 5, 1 being not at all important and 5 being very important. For the Loaded Ladle, 36% of students identified with the loaded ladle being a 5, or very important. 22% of students identified the Loaded Ladle as being a 4 on the scale of importance, 25% identified it as a 3, 5% identified it as a 2, and 12% identified it as a 1 on the scale. For the Dalhousie Urban Garden, 1% identified it as being a level 5 importance to them, 9% identified it as being a level 4, 60% identified it as being a level 3, 8% identified it as being a level 2 and 22% identified it as being a level 1 on the scale of importance. For the DSU food bank, 5% identified it as being a level 5 on the scale of importance, 10% as level 4, 59% as level 3, 6% as level 2 and 20% as level 1 on the scale of importance. Finally, for the DSU farmers market, 12% identified it as being a level 5 on the scale of importance, 16% as a level 4, 48% as a level 3, 11% as a level 2 and 13% as a level 1 on the scale of importance to their well-being.

## **Discussion:**

### **Summary:**

The goal of this study was to evaluate if and, subsequently, how undergraduate students attending the Studley campus of Dalhousie University in Halifax, Nova Scotia, Canada were being or feeling negatively impacted by increasing food cost rises and inflation. Our research questions aimed to evaluate the felt impacts of food insecurity on students as well as if there were any correlations between food insecurity and mental/physical health and academic standing. We also wanted to see if there were any differences in these impacts and overall stresses between individuals majoring in 'green' programs compared to non-green programs. A secondary goal of this research was to draw attention to how the current economy and inflation period is affecting students. It is hoped that the findings can be used to propel Dalhousie University and the Government of Nova Scotia towards the implementation of greater financial support for students in the coming years.

### **Interpretations:**

In a study done on University of Alberta students, of the 58 students studied, 26 were classified as severely food insecure (Farahbakhsh et al., 2016). Of these 26, over 11% reported they had failed or withdrew from a class due to not having enough money to buy food (Farahbakhsh et al., 2016). Additionally, of these 26 students, 73.1% said they were unable to concentrate in class or in an examination due to insufficient funds for food (Farahbakhsh et al., 2016). In our study we found that from our Likert scale questions, of the 109 participants that responded, 57.83% reported agreeing or strongly agreeing that their academic success had been impacted by food insecurity and 37.61% disagreed or strongly disagreed that their academic success had been impacted by food insecurity. There are similarities between findings from both these studies as there are relatively high percentages of students who reported declines in their academic success. Farahbakhsh et al. (2016) also found that the number of students using on-campus food banks was less than the number of students that were facing food insecurity. In our survey, when students were asked about whether they were of various on-campus initiatives, only 57 participants were aware of the on-campus food bank, and 15 students were not aware of any of the on-campus food initiatives. El Zein et al. (2019) also found that of the 77.8% of students they found to be food insecure, only 22.2% utilized their on-campus food pantry. This study by El Zein et al. (2019) supports our finding and that of Farahbakhsh et al. (2016) that the number of students who identify as food insecure or have symptoms of experiencing food insecurity, outweigh the number of students who are utilizing on-campus food initiatives. The study by Farahbahsh et al. (2016) suggests that these low counts are due to stigmatization of using such services and our study suggests a secondary

reason which is unknowingness of the resources available. It is likely that these two reasons are two of the largest contributors to why students are not using services like on-campus food banks. Advertisements of on-campus food security services and initiatives on Dalhousie campus are also very limited which may make it additionally challenging for students to know what resources exist and how or when to access them. Individuals may feel a social or physical barrier to these services because their social group does not use them or because they are unsure of hours of operations or locations of these initiatives. It may also feel isolating to individuals to feel they need these types of supports and therefore they may prolong seeking assistance.

In our study, when asked if they had gone an entire day without eating due to food insecurity, 72% of participants responded 'yes'. This differs from the results found by Twill et al. (2016) who found only 23% of participants reported reducing meals as a solution to food insecurity. This study was conducted in 2016 and this could contribute to the large difference in percentages. We also found that 86% of our respondents were not buying groceries that were most desirable to them. This finding also differs from a finding by Marques et al., who found that nearly 7.5% of their participants changed their eating habits as a strategy to food insecurity (2022). In a paper by Bruening et al. (2016), it was found that students who were food insecure were more likely to view their eating habits as unhealthy. These are all interesting findings, as they all show that many students have changed their eating habits and behaviors in some way to adapt to food insecurity. This is interesting to consider in contrast to the idea of the 'freshman fifteen'. Although it appears many students are reducing their eating, when they do eat meals, they may be opting for less healthy and more low-cost choices which could contribute to this weight gain if it is being seen in students beyond their first year of post-secondary education. To add to this multi-faceted issue, one study by Wattick et al. (2018) noted that mental health declines as both food low in health value and food insecurity increase. They also note that mental health is benefited when healthy foods, like fruit and vegetables, are included in one's diet (Wattick et al., 2018). These findings altogether show how nuanced the issue of food insecurity in university students is. Wattick et al. (2018) shows the positive feedback cycle food insecurity perpetuates as individuals lacking access to food may have decreased mental health, and individuals living with depression showed less fruit and vegetable intake than those who not living with depression. As access to food decreases, mental health declines, and as mental health declines, healthy eating habits reduce further (Wattick et al., 2018). If we were to track the participants of our study long-term, we could predict from these previous studies that mental wellness would decrease based on this feedback loop. Our study found that 67% of those who responded to question 2019 of our survey reported feeling that food insecurity was impacting their physical health. A study by El Zein et al. (2019) noted that chronic exposure to food insecurity increases the risk of obesity, hypertension, and cardiovascular disease. They also noted that those who are food insecure tend to be less



physically active than those who identify as being food secure (El Zein et al., \*\*). This again could have a correlation to the cliché ‘freshmen fifteen’. Overall, although we found higher percentages of students who changed their eating habits than those reported in previous studies, the studies by Marques et al. (2022) and Twill et al. (2016) support that these behaviors are being seen, to various degrees, in students as a strategy to combat food insecurity. Although the number in this study differs greatly from those in previous studies, food insecurity in students is not a novel issue and from these past studies it is clear that this is an issue that has been persisting for years and it is likely that this will only continue to increase if not addressed at the root of it.

Lastly, it is important to investigate the relevance and importance of rent and grocery costs. Our study found that 70% of participants spent greater than or equal to \$700 per month on rent, with 24% of these individuals paying more than \$1000 per month, which is based on the 113 responses to this question. 36% of participants reported spending \$151 – 250 per month on groceries, while 33% reported spending \$251-350 per month on groceries and 15% reported spending more than \$350 per month on groceries, based on 110 responses. Currently, Nova Scotia has implemented a rent cap of an additional 2% maximum increase per year, however this only applies to leases being re-signed at the end of the fixed-term and does not apply to new leases (Services Nova Scotia and Internal Services, 2023). After 2024, the rent cap can increase to a 5% rise annually (Services Nova Scotia and Internal Services, 2023). Although these increases are minimal, they can add up across the span of a 12-month period. Additionally, because the rent cap does not apply to new leases, individuals signing into new fixed-term leases may be faced with landlords increasing the previous rent for the unit more than they would legally be allowed to be if the same tenants were resigning. Because Nova Scotia is also amidst a housing crisis, landlords are capable of illegally increasing their rent and if their current tenants are unwilling to accept the new charges, they could face eviction or similar strategies to replace the existing tenants with new ones. A study done by Fletcher et al. (2009) found that food insecurity increases for low-income households when rent costs increase. We can see from our study that 70% of participants reported paying more than \$700 per month in rent, and 65% reported altering their diet, 86% have compromised on their desired groceries, and 77% reported taking fewer trips to the grocery store. As these percents are relatively similar, it could be inferred that as rent surpasses \$700 per month, diets become more altered, grocery compromises increase, and the average number of trips to the grocery store decreases.

Overall, although we found similar trends to those found in previous studies, we found a higher percentage of students changing their eating and shopping behaviors due to food insecurity and food stresses. We also found that of the 115 responses, 44% of participants responded that they were majoring in sciences, however, 63% of participants have taken a sustainability or environmental science course at

some point in their degree. This shows many students likely have some type of background knowledge in environmental health and sustainability even if their primary program of study is not science or environmental science.

### **Implications:**

The findings from this research paper have the capacity to have strong local impacts. This paper can be used by Dalhousie University to see where undergraduate students are struggling in reference to food insecurity. By having access to this type of information, we are optimistic Dalhousie University will introduce university-led initiatives and shift the responsibility of reducing on-campus food insecurity away from student-led initiatives, like the on-campus food bank and urban garden. Dalhousie should be allocating resources to businesses that can provide healthy and low-cost food to students, as well as to employing individuals to lead these kinds of initiatives. Reducing the felt effects of food insecurity in students should be an issue for Dalhousie, not an issue for the students to solve. These findings should be presented to Dalhousie University alongside findings from the Dalhousie Student Union (DSU), who notes that tuition caps are only in place for Nova Scotia residents, while no limits are put on out-of-province and international students. Although Dalhousie University reported an additional 3% and 7.5% tuition increase for domestic and international students, respectively, for the upcoming 2023/2024 academic year (Dalhousie Student Union, n.d.), it can be assumed from our study that student's mental and physical health, as well as academic standing, will continue to decline due to these increases in fees.

### **Limitations:**

There were a number of limitations associated with the study. One major limitation resulted from the use of Jotform as our survey platform, as mentioned previously. This acted as a limitation as it allowed for the creation of the survey for free but required a payment to keep the survey live four days after being made public. As a team, it was decided that no monetary investment in the survey would be made and due to this the survey automatically closed at noon on March 16, 2023. This limited our survey to being available for responses for six full days and two half days, making it available for approximately seven days in total. 115 submissions were collected within the seven days, and based on these numbers, it is possible the survey could have reached 375 individuals, which would have made this research representative of the greater population. Because of the limits of our survey platform, it also limited the degree of representation of the greater population. Because this study cannot be considered representative, additional research on this topic should be carried out.

An additional limitation from the use of Jotform was limited financial resources. It would have cost \$40 CAD to continue collecting survey submissions, however, although it is only \$10 per team

member, this can be a barrier as students often do not have abundant disposable income. Based on the commitment to this study, it made more sense to close the survey early than begin having financial investments in this study. However, had this financial contribution been made, it is possible enough responses could have been collected to make this study representative. Ultimately, there are many pros and cons that had to be weighed while making this decision. Additionally, the specificity of the demographic being sampled could be seen as a limiting factor in this study. It would be interesting to see how graduate students or faculty are affected by food insecurity in comparison to undergraduate students living off campus. Food insecurity is not limited to undergraduate students living off campus so it would be interesting and useful to see how it compares across demographics. Being able to study these differences and then compare them would also likely be very helpful for advocating for policy change and greater financial support for individuals or cohorts of individuals more at-risk of facing food insecurity. Another limitation could be argued to be topic broadness.

Food insecurity is a general topic and there are a number of issues it could be focused on such as mental health impacts, academic impacts, and social impacts. It would be worthwhile for research to be done on as many of these issues as possible as it is difficult to address all of them in one study. However, they are all important topics, especially as all living costs are continuing to rise. Another limitation is the assumption of the honor system through self-reporting. Because a survey was used for this, it had to be assumed that the information being provided by the participants was accurate, however, individuals could skew their answers for several reasons, such as personal feelings of food insecurity stigmatization. For this reason, a “prefer not to answer” option was provided for sensitive questions and sensitive questions were not required in order for the individual to submit their response. However, this created another limitation as there was not a uniform number of responses per question, making some questions seem that few students are being impacted compared to other statistics, however, if the data is analyzed further, these numbers appear to be smaller than expected because not all 115 participants responded.

Additional to the limitation of self-reporting is the limitation that comes along with using Likert scale questions. This is a limitation because the felt experiences of individuals are unique and it may be difficult for individuals to choose a box that best describes their personal experiences, and this limitation could be applied to all questions that are subjective and based on personal experience. There was a time constraint to this that could be considered a limitation. This study was limited to the duration of this course as well as by the availability of all team members. Because of this, all components of this study were limited, from topic formulation to data collection and report finalization. It would be useful to be able to research this topic long-term in order to see how trends in inflation and food insecurity change annually as well as across demographics.

Lastly, research on behavior changes based on degree type was limited. In the study, faculty was identified by participants however, program was not, therefore this limited our ability to be able to identify if one's program was considered a 'green' degree. Sustainability students were also exempted from this study, therefore removing a major program that is likely to be considered green. The term 'green' degree is also new, making a universal definition difficult. Because of these, no major or significant findings were discovered for this research question.

### **Future Suggestions:**

For any future research that aims to build on our findings, there are many suggestions that can be made. The first suggestion would be to have background knowledge on various survey platforms to determine which one would best suit the study as well as be user friendly and allow for an adequate data collection period. It would also be interesting to have future studies similar to this take place at other universities across Canada to compare how post-secondary students nationally are being affected by rising living costs and assess if there are any trends among institutes or regions. In the future, Dalhousie University should invest in more mental health and physical health initiatives and supports. Dalhousie University currently takes part in Mental Health Week that occurs in March each year, however, many activities that occur during this time are run by student-led societies. Dalhousie should invest more in their students' wellbeing by having similar events running throughout the year and bringing in therapy dogs more frequently and advertising these days, as a few examples for future improvements. Dalhousie should also consider having beginner days or hours at the campus gym to allow for more individuals to feel more comfortable beginning a workout routine.

Moving forward, Dalhousie University should also implement university-led initiatives to reduce food insecurity as well as introduce new bursary and scholarship opportunities throughout the school year. This could be done by reallocating university revenue towards employing full-time staff to create and run food initiatives as well as reallocate funds to the creation of new financial assistance programs for students. Dalhousie also uses grocery store gift cards as incentive to complete SLEQ (student learning experience questionnaire), however they could be doing draws like this throughout the year and could providing financial support as more than just an incentive or a means to an end, as Dalhousie University is currently doing. The Government of Nova Scotia should also work towards implementing a tuition cap for all students attending Nova Scotia universities, not just Nova Scotia-born individuals, like Dalhousie University currently has in place. Nova Scotia universities fall "under jurisdiction of the provincial Ministry of Labour and Advanced Education" (Universities Canada, n.d.) which is responsible for ensuring quality however, the annual rising tuition at Dalhousie University should be assessed to see if the quality of education being delivered is increasing alongside tuition or if these increasing tuition rises

are unnecessary. Reducing tuition and associated education fees could help individuals redirect their available income and finances towards basic necessities like food and housing. This would help ensure they do not have additional stresses on top of university that could hinder their academic success and mental wellbeing.

### **Conclusion:**

To conclude our study, we found that Dalhousie undergraduate students who participated in our study held on the Studley campus are suffering from the rising issue of food insecurity. According to our research, as well as answers in the surveys and interviews, the rising cost of food is one of the major contributing factors to the increase in food insecurity. This issue is further worsened by the overall increase in living expenses due to inflation like food, housing, and transportation which are basic necessities for all students. There is an indefinite correlation between food insecurity and mental health. When battling food insecurity, a student is forced into finding ways to combat their issue, which in turn will take time away from academics. As well, the trend may persist in social life or other aspects of life due to a lack of ability to socialize without monetary transactions taking place. In order to address the problem of food insecurity among college students, it is necessary to understand the underlying causes of the issue. Working also provides little compensation as studies mentioned previously show how the inadequate minimum wage is not just to support basic necessities. Students who work low-wage jobs are likely to have less time for academics due to out-of-school commitments.

In order to address this issue systemic change is needed. One way in which this could be done would be to raise the minimum wage to reflect the cost of living. This would better support people of low income as they would have an adequate amount of money to pay for the basic necessities of life, such as personal costs, transportation, or housing costs. In this case, the result for the individual in low-income households would be having a larger ability to purchase groceries. For students in the meantime, the University offers many on-campus resources to help students have an inexpensive and more well-balanced diet. The loaded ladle, and food bank in the future would need to have a large ability to promote to students so a larger amount of people is able to access these resources. As well, over time funding and growth will come to the urban garden which will be able to promote more fresh produce for students to collaborate on to have a part of their diet. Although financial resources are helpful, over 90% of students have felt the effect of inflation recently, so there is a larger issue that needs to change, but the resources provided also have space to grow.

Finally, the rising cost of food is undeniably contributing to the problem of food insecurity among Dalhousie students living off-campus. This issue is increased due to inflation which has also affected

living expenses due, as well as allowing students to afford necessities. To address this issue, systemic changes are needed, such as an increase in the minimum wage. In the meantime, on-campus initiatives can be implemented to mitigate the effects of food insecurity. It is imperative that we continue to prioritize this issue and provide students with access to nutritious food to maintain a healthy and active academic career.

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## **Appendices**

1. Survey poster and link
2. REB
3. Consent form written as shown in survey
4. Professors and faculty contacted
5. Poster locations
6. Raw data from survey

## 1. Survey

**Hungry...  
for change?**

Have you thought about the rise in food cost from the current inflation crisis?

Are you an undergraduate student from Studley campus living off-campus?

Has the rise in food cost made you reconsider your finances?

Please fill out this ~7 minute survey to help ENVS 3502 students identify food insecurity among Dalhousie students

PLEASE CONTACT SH894777@dal.ca if you would like to be selected for an additional interview on this topic

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<https://www.jotform.com/230525435500041>

## 2. REB



# RESEARCH ETHICS BOARDS APPLICATION FORM

## Prospective Research

This form should only be used if new data will be collected. For research involving only secondary use of existing information (such as health records, student records, survey data or biological materials), use the *REB Application Form – Secondary Use of Information for Research*.

This form should be completed using the [Guidance for Submitting an Application for Research Ethics Review](#).

**SECTION 1. ADMINISTRATIVE INFORMATION  
only]**

[File No:

**office**

Indicate the preferred Research Ethics Board to review this research:

[ ] Health Sciences OR [x] Social Sciences and Humanities

**Project Title:**

ENVS3502 Research Project: How Undergraduate Students Living Off-Campus at Dalhousie University are Managing Food Insecurity

1.1 Research team information			
Lead researcher (at Dalhousie)	Name	Sheylee Arishenkoff	
	Email (@dal)	<a href="mailto:Sh894777@dal.ca">Sh894777@dal.ca</a>	Phone
	Banner #		Academic Unit <b>Environmental Science</b>
Co-investigator names, affiliations, and email addresses	Kayleigh Makarucha, Research team member, <a href="mailto:ky922438@dal.ca">ky922438@dal.ca</a> Abbie Gingles, Research team member, <a href="mailto:a.gingles@dal.ca">a.gingles@dal.ca</a> Josh Scott, Research team member, <a href="mailto:js371297@dal.ca">js371297@dal.ca</a>		
Contact person for this submission (if not lead researcher)	Name		
	Email		Phone
Study start date	02/09/2023	Study end date	04/11/2023

1.2 For student submissions (including medical residents and postdoctoral fellows)	
Degree program	Environmental Science
Supervisor name and department	Dr. Caroline Franklin

Supervisor Email (@dal)	<a href="mailto:Caroline.franklin@dal.ca">Caroline.franklin@dal.ca</a>	Phone	
Department/unit ethics review (if applicable). <b>Undergraduate minimal risk research only.</b>			
Attestation: <input type="checkbox"/> I am responsible for the unit-level research ethics review of this project and it has been approved.			
Authorizing name:			
Date:			

<b>1.3 Other reviews</b>			
Other ethics review (if any) for this research	Where?	N/A	
	Status?	N/A	
Scholarly/scientific peer review (if any)	N/A		
Is this a variation on, or extension of, a previously approved Dal REB submission?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Dal REB file # _____	
<p><b>If yes</b>, describe which components of the current submission are the same as the previously approved submission (list section numbers), and which components are different from the previously approved submission (list section numbers). You may also use highlighting to clearly indicate revised text.</p>			

<b>1.4 Funding</b>		<input checked="" type="checkbox"/> Not	
Applicable			
Funding (list on consent form)	Agency		
	Award Number		
	Institution where funds are/will be held	<input type="checkbox"/> Dalhousie University <input type="checkbox"/> Other: _____	
Was a Dal release of funds agreement issued for this award?		<input type="checkbox"/> Yes Date of RoF Agreement: _____	

**1.5 Attestation(s).** The appropriate boxes *must* be checked for the submission to be accepted by the REB

I am the **lead researcher** (at Dalhousie) named in section 1.1. I agree to conduct this research following the principles of the Tri-Council Policy Statement *Ethical Conduct for Research Involving Humans* ([TCPS](#)) and consistent with the University [Policy on the Ethical Conduct of Research Involving Humans](#).

I have completed the TCPS Course on Research Ethics ([CORE](#)) online tutorial.

Yes  No

For Supervisors (of student / learner research projects):

I am the **supervisor** named in section 1.2. I have reviewed this submission, including the scholarly merit of the research, and believe it is sound and appropriate. I take responsibility for ensuring this research is conducted following the principles of the [TCPS](#) and University [Policy](#).

I have completed the TCPS Course on Research Ethics ([CORE](#)) online tutorial.

Yes  No

## SECTION 2. PROJECT DESCRIPTION

### 2.1 Lay summary

2.1.1 In **plain language**, describe the rationale, purpose, study population and methods to be used. Include a summary of background information or literature to contextualize the study. What new knowledge, or public or scientific benefit is anticipated? [maximum 500 words]

- Important to understand how the rise in food cost is affecting the well-being of independent students
- To investigate how students from different faculties are managing their lifestyle around the rise in food cost

This is a pilot study.

This is a fully developed study.

2.1.2 Phased review. If a phased review is being requested, describe why this is appropriate for this study, and which phase(s) are included for approval in this application. Refer to the [guidance document](#) before requesting a phased review.

Not applicable

--

<b>2.2 Research question</b>
State the research question(s) or research objective(s).  To determine if undergraduate students at Dalhousie University living off campus are impacted by rising costs of living and experience food insecurity; and if so, how does food insecurity affect their mental health, physical health and academic standing. Additionally, how does individual food insecurity, or security, relate to university major, if at all?

<b>2.3 Recruitment</b>
<b>2.3.1</b> Identify the study population. Describe and justify any inclusion / exclusion criteria. Also describe how many participants are needed and how this was determined.  The population will include undergraduate students attending either Dalhousie's Studley or Sexton campus that live off campus, either dependent or independently of their parents. The goal is to receive surveys from ~100 individuals with individuals being from any degree program.
<b>2.3.2</b> Describe recruitment plans and append recruitment instruments. Describe who will be doing the recruitment and what actions they will take, including any screening procedures.  Recruitment will be done via word of mouth, professor advertisement at the beginning of class periods, and through QR code posters being put up throughout various campus buildings and off-campus third spaces, such as nearby coffee shops and gyms.
<b>2.3.3</b> If you require permission, cooperation, or participation from a community, organization or company to recruit your participants, describe the agreement obtained from the relevant group(s). Attach correspondence indicating their cooperation and/or support (required). Describe any other community consent or support needed to conduct this research. (If the research involves Indigenous communities complete section 2.11).  <input type="checkbox"/> Not applicable  We will be going to these facilities to obtain verbal permission from owners and/or managers to put up posters advertising our study. If facilities decline our proposition, we will go elsewhere or only put posters up throughout the university and rely more heavily on word of mouth and professor support.

## 2.4 Informed consent process

### 2.4.1 Describe the informed consent process:

A) How, when and by whom will the study information be conveyed to prospective participants? How will the researcher ensure prospective participants are fully informed?

We will have a consent form at the beginning of our survey that participants must agree to prior to viewing or answering any survey questions. This will be completed via an electronic signature. We will make sure that all information regarding the use of the data, and the option to participants to exit the survey at any time or bypass sensitive questions will also be explained within the consent form. We will also provide an email address so that the individuals can reach out to our group if they have any questions, comments, or concerns regarding the survey or use of the data.

B) Describe how consent will be documented (e.g. written signature, audio-recorded, etc).

Consent must be obtained by all individuals prior to viewing or answering any survey questions, therefore we will know that we received electronic consent for all completed surveys. We will also be able to see how many individuals answered this question when viewing our survey statistics.

[ ] Append copies of all consent information that will be used (e.g. written consent document, oral consent script, assent document/script, etc).

*Note: If the research will involve third party consent (with or without participant assent), and/or ongoing consent, ensure these are described above.*

### 2.4.2 Discuss how participants will be given the opportunity to withdraw their participation (and/or their data) and any time (or content) limitations on this. If participants will not have opportunity to withdraw their participation and/or their data explain why.

Participants can exit the survey at any time and their information will not be collected until they press the submit button. They will also have the option to bypass questions that may be uncomfortable to answer. They will also have access to our email address(es) that they can reach out to prior to, during, or following survey completion and we will make sure this information is clearly stated for them and easily accessible. Time limitations to this may be based on whether participants write down our email at the time of their survey participation. We could reduce this time constraint by including Dr. Franklins contact information as this will be more readily available and public following the data collection period.

### 2.4.3 If an alteration/exception to the requirement to seek prior informed consent is sought, address the criteria in TCPS article [3.7A](#). If the alteration involves deception or nondisclosure, also complete section 2.4.4.

[ x ] Not applicable

2.4.4 Describe and justify any use of deception or nondisclosure and explain how participants will be debriefed.

Not applicable

## 2.5 Methods, data collection and analysis

### 2.5.1

A) Where will the research be conducted?

At Dalhousie University. Responses may also be collected at local third spaces if we are granted permission to post QR codes to our survey at these locations. Individuals may also opt to complete the questions from the comfort of their home but will be up to their discretion.

B) What will participants be asked to do?

Participants will be asked to complete a short survey (~ 5 min or less) made up of single response, rating/ranking questions, as well as multiple selection. No open-ended questions will be asked during the survey. Participants will have the option to complete an in-person interview that will be made up of open-ended questions and be a more thorough investigation into food insecurity.

C) What data will be collected using what research instruments? *(Note that privacy and confidentiality of data will be covered in section 2.6)*

We will be using a public online platform to collect data (online survey platform) as well as software like Microsoft Excel and R Studio will be used to analyze the data following data collection.

D) How much of the participant's time will participation in the study require?

For survey completion, we are expecting to take up 5 minutes of the participants' time, or less. For interviews, it will be dependent on conversation depth, participant comfort, and participant availability.

Append copies of all research instruments (questionnaires, focus group questions, standardized measures, etc)

This is a clinical trial (physical or mental health intervention) – ensure section 2.12 is completed

2.5.2 Briefly describe the data analysis plan. Indicate how the proposed data analyses address the study's primary objectives or research questions.



By obtaining answers from our survey and interview questions we will be able to provide the University with specific issues the students on Studley and Sexton campus have been affected by food insecurity, and using the information, the University can use our study to provide meaningful ways in which to mitigate these specific issues.

2.5.3 Describe any compensation that will be given to participants and how this will be handled for participants who do not complete the study. Discuss any expenses participants are likely to incur and whether/how these will be reimbursed.

No monetary compensation will be provided to the participants.

## 2.6 Privacy and confidentiality

### 2.6.1

A) Describe who will have knowledge of participants' identities.

No one will have knowledge of the participants' identities as names, banner numbers, and additional personal information are irrelevant to the research questions. Emails will be provided voluntarily by the participants if they want to do a more in-depth interview or be notified about the study's results.

B) Describe the level of identifiability of the study data (anonymous, anonymized, de-identified/coded, identifying) (see [TCPS Chapter 5A – types of information for definitions](#)).

Anonymous

C) Specify which members of the research team (or others) will have access to participants' data and for what purpose.

The four group members will have access to the data to complete analyses on the information collected and to allow for this to be done as a team to balance the workload of the study.

D) Describe measures to ensure privacy and confidentiality of study documents and participant data during the data collection and analysis phase. *[Note that plans for long term storage will be covered in 2.6.2]*

- Address: handling of documents/data during data collection; transportation or transfer of documents/data; storage of documents/data (during the study).
- If a key-code will be maintained, describe how it will be kept secure.
- For electronic data, describe electronic data security measures, including file encryption and/or password protection [as applicable](#).
- For hard copy documents, describe physical security measures (specify location).

We will use online formats to provide an anonymous archive of answers and responses to ensure people in which were surveyed will not be known by people reviewing the data. After we finish the process of sharing the finding, all findings will be deleted and not be

seen again.

This research involves personal health records (ensure section 2.13 is completed)

2.6.2 Describe plans for data retention and long-term storage (i.e. how long data will be retained, in what form and where). Will the data eventually be destroyed or irreversibly anonymized? If so, what procedures will be used for this? Discuss any plans for future use of the data or materials beyond the study currently being reviewed.

We will delete all data collected after the data is analyzed and used for writing our report and creating a presentation. We will use the garbage function online as well as our personal devices to ensure the archived data no longer exists. Furthermore, the data will be anonymous in order to keep identity hidden.

This research will be deposited in a data repository (ensure section 2.14 is completed)

### 2.6.3

Describe if/how participant confidentiality will be protected when research results are reported:

A) For quantitative results - In what form will study data be disseminated?

Only aggregate data will be presented

Individual de-identified, anonymized or anonymous data will be presented

Other. If "other", briefly describe dissemination plans with regard to identifiability of data.

Not applicable, only qualitative data will be presented

B) For qualitative results - Will identifiable data be used in research presentations/publications? If participants will be quoted, address consent for this and indicate whether quotes will be identifiable or attributed.

Survey results will all be able to be categorized and coded for data analysis. Interview responses may record quotes that will later be used in the final report, but this will be communicated to the interview participants. We will also get either verbal or written consent when conducting interviews.

Not applicable, only quantitative data will be presented

2.6.4 Address any limits on confidentiality, such as a legal duty to report abuse or neglect of a [child](#) or [adult in need of protection](#), and how these will be handled. Ensure these are clear in the consent documents. (See the [guidance document](#) for more information on legal duties and professional codes of ethics).

Not applicable

2.6.5 Will any information that may reasonably be expected to identify an individual (alone or in combination with other available information) be accessible outside Canada? And/or, will you be using any electronic tool (e.g. survey company, software, data repository) to help you collect, manage, store, share, or analyze personally identifiable data that makes the data accessible from outside Canada?

No

Yes. If yes, refer to the University [Policy for the Protection of Personal Information from Access Outside Canada](#), and describe how you comply with the policy (such as securing participant consent and/or securing approval from the Vice President Research and Innovation).

## 2.7 Risk and benefit analysis

2.7.1 Discuss what risks or discomforts are anticipated for participants, how likely risks are and how risks will be mitigated. Address any particular ethical vulnerability of your study population. Risks to privacy from use of identifying information should be addressed. If applicable, address third party or community risk. (If the research involves Indigenous communities also complete section 2.11)

Since using online public sites to store information, we have the possibility to have information hacked or taken via online platform. The survey will be anonymous to ensure privacy for contributors.

2.7.2 Identify any direct benefits of participation to participants (other than compensation), and any indirect benefits of the study (e.g. contribution to new knowledge).

The benefits would be to diminish the stigma as well as hopefully contribute to more secure options for Dalhousie students.

## 2.8 Provision of results to participants and dissemination plans.

2.8.1 The TCPS encourages researchers to share study results with participants in appropriate formats. Describe your plans to share study results with participants and discuss the process and format.

Participants will be able to leave an email to be sent the findings, but this also lowers the level of anonymity for that participant. We will also have a paper on the Dalhousie website as well as a in-class presentation

2.8.2 If applicable, describe how participants will be informed of any material incidental findings – a discovery about a participant made in the course of research (screening or data collection) that is outside the objectives of the study, that has implications for participant welfare (health, psychological or social). See [TCPS Article 3.4](#) for more information.

[ x ] Not applicable

2.8.3 Describe plans for dissemination of the research findings (e.g. conference presentations, journal articles, public lectures etc.).

In-class presentation, as well as a research paper. Findings may also be released to participants via email if they request during the survey process.

## 1.9 Research Team

2.9.1 Describe the role and duties of all research team members (including students, RA's and supervisors) in relation to the overall study.

All students involved will work in collaboration to obtain findings, obtain knowledge of past research and to present the findings via presentation and paper.

2.9.2 Briefly identify any previous experience or special qualifications represented on the team relevant to the proposed study (e.g. professional or clinical expertise, research methods, experience with the study population, statistics expertise, etc.).

Joshua – prior work with indigenous communities to ensure the research is humane and ethical

Abbie- knowledge of ArcGIS mapping software and R Studio which could be used to produce quantitative results of our collected data

## 2.10 Conflict of interest

Describe whether any dual role or conflict of interest exists for any member of the research team in relation to potential study participants (e.g. TA, fellow student, teaching or clinical relationship), and/or study sponsors, and how this will be handled.

Respondents may include individuals the research team is acquainted with, friends with, or lives with, however all survey answers will be anonymous to maintain a high level of security.

Not applicable

## 2.11 Research involving Indigenous peoples

Consult TCPS [Articles 9.1 and 9.2](#) in determining whether this section is applicable to your research.

Not applicable – go to 2.12

2.11.1 If the proposed research is expected to involve people who are Indigenous, describe the plan for community engagement (per TCPS [Articles 9.1 and 9.2](#)). If community engagement is not sought, explain why the research does not require it, referencing TCPS article 9.2.

2.11.2 State whether ethical approval has been or will be sought from [Mi'kmaw Ethics Watch](#) and if not, why the research does not fall under their purview. If the research falls under the purview of other Indigenous ethics groups, state whether ethical approval has been or will be sought.

2.11.3 Describe plans for returning results to the community and any intellectual property rights agreements negotiated with the community with regard to data ownership (see also 2.11.4 if applicable). Append applicable research agreements.

2.11.4 Does this research incorporate OCAP (Ownership, Control, Access, and Possession) principles as described in TCPS [Article 9.8](#)?

Yes. Explain how.

No. Explain why not.

## 2.12 Clinical trials

Not applicable – go to 2.13

2.12.1 Will the proposed clinical trial be registered?

No. Explain why not.

Yes. Indicate where it was/will be registered and provide the registration number.

2.12.2 If a novel intervention or treatment is being examined, describe standard treatment or intervention, to indicate a situation of clinical equipoise exists (TCPS [Chapter 11](#)). If placebo is used with a control group rather than standard treatment, please justify.

2.12.3 Clearly identify the known effects of any product or device under investigation, approved uses, safety information and possible contraindications. Indicate how the proposed study use differs from approved uses.

Not applicable

2.12.4 Discuss any plans for blinding/randomization.

2.12.5 What plans are in place for safety monitoring and reporting of new information to participants, the REB, other team members, sponsors, and the clinical trial registry (refer to TCPS [Articles 11.6, 11.7, 11.8](#))? These should address plans for removing participants for safety reasons, and early stopping/unblinding/amendment of the trial. What risks may arise for participants through early trial closure, and how will these be addressed? Are there any options for continued access to interventions shown to be beneficial?

## **2.13 Use of personal health information**

Not applicable

2.13.1 Research using health information may be subject to Nova Scotia's [Personal Health Information Act](#). Describe the personal health information ([definition explained in the guidance document](#)) required and the information sources, and explain why the research cannot reasonably be accomplished without the use of that information. Describe how the personal health information will be used, and in the most de-identified form possible.

2.13.2 Will there be any linking of separate health data sets as part of this research?

No

Yes

If yes:

A) Why is the linkage necessary?

B) Describe how the linkage will be conducted (it is helpful to append a flow diagram)

C) Does that linkage increase the identifiability of the participants?

2.13.3 Describe reasonably foreseeable risks to privacy due to the use of personal health information and how these will be mitigated.

## 2.14 Data Repositories

Not applicable

2.14.1 Identify and describe the data repository in which the research data will be deposited. What is its focus, who are its target users, who can access deposited data and under what circumstances? For how long will the data be kept in the repository?

2.14.2 Describe the data set to be released to the repository. If there is personal and/or sensitive information in the data, describe how you will prepare the data for submission to the repository and mitigate risks to privacy. Identify all fields that will be included in the final data set (include as an appendix).

2.14.3 Is agreeing to have one's data deposited a requirement for participation in the study? If yes, provide a justification. If no, indicate how participants can opt in or out.

## SECTION 3. APPENDICES

**Appendices Checklist.** Append all relevant material to this application in the order they will be used. This may include:

- Reference list
- Permission or support/cooperation letters (e.g. Indigenous Band Council, School Board, Director of a long-term care facility, anyone whose permission you need to conduct recruit participants or conduct research)
- Research agreements (required for research involving Indigenous communities)
- Recruitment documents (posters, oral scripts, online postings, invitations to participate, etc.)
- Screening documents
- Consent/assent documents or scripts
- Research instruments (questionnaires, interview or focus group questions, etc.)
- Debriefing and/or study results templates
- List of data fields included in data repository
- Confidentiality agreements

### 3. Consent Form as Written in JotForm:

You are invited to take part in a research study being conducted by, Shey Arishenkoff, Kayleigh Makarucha, Josh Scott, and Abbie Gingles who are undergraduate students in Environmental Science, Sustainability, and Biology at Dalhousie University. The purpose of this research is to help mitigate food insecurity and the rise of undergraduate students who are being negatively affected by these issues by assessing the fundamental problems that the Dalhousie University students have through means of an online survey. Participating surveyors will be selected as being an undergraduate student living off campus. The study is funded by Shey Arishenkoff, Kayleigh Makarucha, Josh Scott, and Abbie Gingles. If you choose to participate in this research you will be asked to anonymously answer a list of survey questions on your personal experience/feelings with the current increase in inflation prices and food insecurity. the final question of the survey will ask if you would like to be interviewed by the research team for further data collection. This question is completely optional but if agreed to, your identity will be revealed to the research team but will be kept anonymous from the final report. The survey should take approximately 10 minutes. Your participation in this research is entirely your choice. You do not have to answer questions that you do not want to answer (by selecting prefer not to answer), and you are welcome to stop the survey at any time if you no longer want to participate. All you need to do is close your browser. I will not include any incomplete surveys in my analyses. If you do complete your survey and you change your mind later, I will not be able to remove the information you provided as I will not know which response is yours. Your responses to the survey will be anonymous. This means that there are no questions in the survey that ask



for identifying details such as your name or email address. All responses will be saved on a secure Dalhousie server. Only Shey Arishenkoff, Kayleigh Makarucha, Josh Scott, and Abbie Gingles will have access to the survey results. I will describe and share general findings of this research in my final research project for Environmental Problem Solving Part II. I will destroy all information 12 months after completing/reporting the results. The perceived risks associated with this study could include discomfort in answering personal questions regarding finances. This is mitigated by including an option not to answer these questions in the survey. There will be no direct benefit to you in participating in this research. The research, however, might contribute to new knowledge on the effect food insecurity has on different groups of university students. You should discuss any questions you have about this study with the research team Shey Arishenkoff, Kayleigh Makarucha, Josh Scott, Abbie Gingles and supervisor Dr. Caroline Franklin. Please ask as many questions as you like before or after participating. My contact information is [Sh894777@dal.ca](mailto:Sh894777@dal.ca). If you have any ethical concerns about your participation in this research, you may contact Research Ethics, Dalhousie University at (902) 494-3423, or email [ethics@dal.ca](mailto:ethics@dal.ca) (and reference REB file # 20XX-XXXX).” If you agree to complete the survey, please follow the link here/click continue.

#### 4. Professors contacted

	A	B	C	D	E	F	G
1	Who has been given posters	Emailed?	Date Emailed	Y/N	Followed up & Date	Faculty/Course	
2	Professors	Yes	M9	Yes, posting on BS and emailing out	03/15/2023 – Showed	MGMT/SUST, Sustainable Industries	1
3	Michelle Adams	Yes	M9	Showing in class (Mar 10th)		SUST/ Conflict Man	
4	Andrew Bergel	Yes	M9	Posted on BS SUST 3101 & 2105		SUST/ Conflict Man	
5	Laurel Shut	Yes	M9			ENVS/GIS courses	
6	Chris Greene	Yes	M9			JOUR/ Photojournalism	
7	Michael Craegen	Yes	M9			SUST/ Conflict Man	3
8	Marin Carey (TA)	Yes	M9				
9	Tsafrir Gazit	Yes	M9				
10	Jeff Zahavich	Yes	M9	Yes, will post to classes		HAHP/ Kinesiology	
11	Ellen Jamieson	Yes				BIOL	
12	Hike Lotze	Yes		Yes, will post to classes		BIOL	
13	Kelvin Fong	Yes		Yes, will post to classes		ENVS	
14	Isabelle Aube	Yes		Posted it on Brightspace announcements		BIOL	
15	Caroline Franklin	Yes				ENVS/SUST	1
16	Debra Grantham	Yes				BIOL	4
17	Sarah Moore	Yes	M11			HAHP/ Kinesiology	2
18	Michael Metzger	Yes	M11	Yes, will post to classes		Physics	1
19	CJ Blye	Yes	M12			Recreation and Leisure	1
20	Hamed Aghakhani	Yes	M14			Commerce	1
21	Attig Najah	Yes	M14			Commerce	2
22	Jim Barker	Yes	M14			Commerce	3
23	Louis Beaubien	Yes	M14			Commerce	4
24	Simon berge	Yes	M14			Commerce	5
25	Kimberley Brooks	Yes	m14			Commerce	6
26	M Brooks	Yes	M14			Commerce	7
27	Sergio Carvalho	Yes	M14			Commerce	8
28	Jenny Chen	Yes	M14			Commerce	9
29	Kyla Chisholm	Yes	M14			Commerce	10
30	Shamsud Chowdhury	Yes	M14			Commerce	11
31	Nan Clory	Yes	M14			Commerce	12
32	Anika Cloutier	Yes	M14	not teaching this term		Commerce	13
33	Scott Comber	Yes	M14	On sebatide		Commerce	14
34	Tammy Crowell	Yes	M14			Commerce	15
35	E Crumley	Yes	M14			Commerce	16
36	Laura Cumming	Yes	M14	On sebatide		Commerce	17
37	Peggy Cunningham	Yes	M14	emailing to students		Commerce	18
38	Leo-Paul Dana	Yes	M14			Commerce	19
39	Qj Deng	Yes	M14			Commerce	20
40	Helene Deval	Yes	M14	not teaching right now		Commerce	21
41	Mohammed El Hazzouri	Yes	M14			Commerce	22
42	Alexander Engau	Yes	M14			Commerce	23
43	Iraj Fooladi	Yes	M14			Commerce	24
44	Bill Foster	Yes	M14			Commerce	25
45							
46	Posters						
47	Josh	18 Posters	Mens room, underground walkway to killam, computer science building				
48							
49							
50							

#### 5. Poster locations

#Posters	Building/general locations	Date Completed	Person Responsible	# of posters
	LSC		Abbie	5
	James Dunn		Abbie	2
	Henry Hicks		Josh	
	Chem Building	11-Mar-23	Sheylee	5
	Sub		Kayleigh	
	Killam		Abbie	5
	McCain (on uni)		Kayleigh	
	McCain Learning Commons		Josh	
	Mona Campbell	13-Mar-23	Sheylee	4
	Rowe		Kayleigh	
	Kings		Josh	
	Law		Kayleigh	
	Comp Sci Building (Goldberg)		Kayleigh	
	Ocean Sci		Josh	
	OFF CAMPUS			
	Coburg Social	11-Mar-23	Sheylee	1
	Uncommon Grounds		Kayleigh	
	Glitter Bean		Abbie	1
	Seven Bays	March 10th, 2023	Abbie	1
	Noggins	11-Mar-23	Sheylee	1
	Nova		Josh	
	Local Source		Kayleigh	
	East Peak	12-Mar-23	Sheylee	1
			Total poster:	26

## 6. Raw data

A			
1	Current Dal Undergrad ?	42	Percentage covered by income
2	Y: 112	43	100%: 30
3	N: 2	44	50% : 6
4	Identify as Minority	45	not renting 1
5	N:91	46	Less than 50%: 24
6	Pref not to say: 5	47	More than 50%: 12
7	Y: 19	48	loans: 1
8	Faculty	49	none 40
9	Arch & Design: 7	50	other 1
10	Arts: 24	51	In past 6 mo, cost increase?
11		52	n 1
12		53	unsure 2
13	Commerce: 16	54	yes 110
14	Health 7	55	average monthly cost groceries
15	Man 11	56	151-250 : 40
16	Science 51	57	151-250, 251-300: 2
17	Have you taken SUST course	58	251-350: 36
18	y 73	59	51-150: 13
19	n 42	60	51-15-, 150-250: 2
20	Currently living off campus	61	more than 350: 17
21	n 2	62	Percentage covered by income
22	y 109	63	0%: 15
23	Currently renting ?	64	100%: 59
24	n 7	65	exactly 50%: 4
25	y 108	66	less than 50: 23
26	Zone renting in	67	more than 50: 11
27	a 24	68	prefer not to say: 1
28	b 56	69	Where do u buy groceries
29	c 18	70	superstore: 62
30	d 7	71	Sobeys: 29
31	e 4	72	Walmart: 13
32	f 1	73	Petes: 5
33	hammonds plains 1	74	Costco: 2
34	on border downtown and studley 1	75	dsu market 1
35	waverly 1	76	dollarstore 1
36	Rent Price	77	no frills 1
37	5-7 : 27	78	gateway 1
38	7-1: 60	79	online 1
39	not renting 6	80	local source 1
40	less than 5 : 1	81	noggins 1
41	More than 1000: 19		
		82	Worried food would run out
		83	no 67
		84	prefer not to say 2
		85	y 43
		86	not been able to afford a balanced meal
		87	no 61
		88	prefer not to say 2
		89	yes 49
		90	cut or skipped due to cost
		91	no 46
		92	yes 65
		93	been hungry, not eaten due to cost
		94	no 62
		95	prefer not to say 2
		96	yes 47
		97	altered diet
		98	no 36
		99	yes 72
		100	prefer not to say 3
		101	compromised on desired groceries
		102	n 14
		103	yes 95
		104	prefer not to say 1
		105	taken fewer trips
		106	no 15
		107	yes 97
		108	gone entire day not eating
		109	no 81
		110	yes 31
		111	mental health impacted by food insecurity
		112	agree 33
		113	disagree 17
		114	neutral 24
		115	somewhat agree 32
		116	somewhat disagree 8
		117	sleep impacted
		118	no 74
		119	yes 38
		120	prefer not to say 2
		121	increased stress
		122	no 24
		123	unsure 19
		124	yes 69

125	academic success impacted
126	agree 18
127	disagree 28
128	neutral 18
129	somewhat agree 30
130	somewhat disagree 13
131	unsure 2
132	physical health impacted
133	agree 46
134	disagree 18
135	neutral 12
136	somewhat agree 31
137	somewhat disagree 7
138	unsure 1
139	which food initiatives are you aware of
140	none 15
141	urban garden 26
142	farmers market 80
143	food bank 57
144	ladle 96
145	rank each initiative
146	ladle:
147	1, 13
148	2, 6
149	3, 28
150	4, 24
151	5, 40
152	urban garden:
153	1, 23
154	2, 8
155	3, 62
156	4, 9
157	5, 1
158	food bank:
159	1, 20
160	2, 7
161	3, 64
162	4, 11
163	5, 6
164	farmers market:
165	1, 12
166	2, 12
167	3, 51
168	4, 17
169	5, 13