University of British Columbia

Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

UBC Climate-Friendly Food System (CFFS) Procurement Strategy:

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EXECUTIVE SUMMARY

A review of past research indicates that global warming is an imminent issue for all Canadians — trends predict temperature values to rise 0.2°C per decade (IPCC, 2019). Food systems are responsible for 34% of global greenhouse gas (GHG) emissions and are a significant contributor to increased runoff, extreme weather events, and flooding throughout Canada, and globally (Crippa et al., 2021; IPCC, 2019). Canadian food consumption trends have led to long-term, broad impacts that have accelerated climate change (IPCC, 2019). Therefore, addressing these issues will require action from everyone, including The University of British Columbia (UBC).

UBC is well-positioned to lead an integrated approach in creating a just and resilient campus-wide food system; however, food procurement strategies and consumption patterns have not yet been sufficiently analyzed. Our project informs the development of a campus-wide Climate-Friendly Food System (CFFS) Procurement Strategy to reduce GHGs and engage with UBC's Climate Action Plan 2030 (CAP). Working alongside UBC Student Housing and Community Services (SHCS), and Campus + Community Planning (SEEDS), we developed a Climate-Friendly Food Systems (CFFS) procurement strategy in order to aid our community partners reach their goal of reducing food system-related GHG emissions by 50% in 2025. Our project achieved several goals, including (1) providing knowledge and information on campus-wide food-supply practices, (2) developing a Climate-Friendly Food System Procurement Strategy, and (3) providing recommendations to our community partners of Campus and Community Planning, and UBC Student Housing and Community Services that will help to reduce UBC's GHG emissions.

We conducted primary data collection through a focus group and interviews with individuals involved in UBC's food system via Zoom, and secondary data collection through practitioner literature reviews to identify high impact opportunities, frameworks, policies, and promising practices to reduce procurement-related GHG emissions at UBC. Based on these results we categorized our results into three major areas of opportunity which were: plant-based, seasonality/locality, and monitoring. To give a broad overview of our primary and secondary results, they indicated that UBC would find it useful economically and environmentally to promote more plant-based menu offerings, conflicting evidence between primary and secondary data on the effects of procuring locally/seasonally, and to emphasize the monitoring of progress towards decreasing GHGs and ensure accountability throughout UBC's food system. Our discussion revealed that plant-forward was a high impact opportunity for reducing GHGs, that we should focus on a variety of metrics for food procurement rather than focusing solely on locality/seasonality, and that monitoring can help inform the furthering of equity in UBC's food systems. Overall, we acknowledge data limitations such as limited sample size, scope and sampling bias due to the short time frame of this project, but believe that our findings will still prove useful in developing a CFFS Food procurement strategy.

Recommendations found through this project for reducing GHG emissions within the UBC Vancouver Campus Food System include short term recommendations of increasing the appeal and incentivization of plant-based foods, develop climate change accountability benchmarks, and promoting menu switches to less GHG emitting products, and develop assessment tools to determine the sustainability of the food procured at UBC. Long-term recommendations include increased monitoring of food waste to inform a procurement strategy that produces less waste (and therefore fewer emissions), increasing funding to the development of metrics that monitor the GHG emissions associated with foods at UBC, and utilize CFFS metrics to inform food sourcing.

We also developed a comprehensive CFFS Procurement Strategy for the UBC Vancouver campus food system, which is provided externally, which involves climate food procurement targets, indicators, and actions that will help reduce GHG emissions in a holistic manner. Overall, we believe that our CFFS Procurement Strategy, informed by our primary and secondary research results, will prove valuable to our clients when furthering these important initiatives.

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LIST OF ABBREVIATIONS

BDS - Biodiversity Strategies

CBAR - Community-Based Action Research

CFFS - Climate-Friendly Food System

CO_2 - Carbon Dioxide

CSA - Community Supported Agriculture

F2F - Farm to Fork Strategy

GHG - Greenhouse Gas

SEEDS - Social Ecological Economic Development Studies

UBC - University of British Columbia

1. INTRODUCTION

1.1 RESEARCH TOPIC

Globally, over a quarter of greenhouse gas (GHG) emissions are related to food systems (Poore et Nemecek, 2018). Several aspects of the food system are especially intense contributors of GHG emissions, such as dietary patterns and consumption, food waste, packaging, and the seasonality or locality of foods (Garnett, 2009). Our group recognizes the opportunity to mitigate GHG emissions in the context of supply chain vulnerability, such as through promoting plant-forward dietary options, increasing the transparency surrounding climate-friendly food choices, and procuring climate-friendly foods based on seasonality and locality. Based on preliminary analysis of previous GHG interventions, several challenges exist that may impede food system-related GHG mitigation strategies. Primarily, the high-cost associated with producing foods with lower emissions, slow uptake and behavioral changes in implementing mitigation strategies, as well as the influence of broader economic, social, and political issues. A literature review of these challenges suggests the opportunity to introduce more plant-forward initiatives, adapt novel and bolster existing carbon footprint monitoring initiatives, and improve resiliency within our current food supply chains and transport networks.

1.2 RESEARCH RELEVANCE

It is well known that anthropogenic activities have caused drastic changes in our climate. For example, agriculture, transportation, consumption and waste patterns emit markedly high levels of greenhouse gasses (GHGs); the primary cause of global warming (IPCC, 2019). Presently, global warming values are estimated to be approximately 0.2 degrees Celsius per decade, though it is hypothesized that we are only a few decades away from reaching the proclaimed ‘limit’ of global warming before life on Earth faces significant consequences (IPCC, 2019). Among such consequences would include increased risk of flooding, runoff, cataclysmic weather events, and warming of land to above habitable temperatures in some regions of the world (IPCC, 2019).

When striving to tackle climate change, many mitigation strategies have revolved around food system-related contributors. For example, food waste and packaging ultimately decompose in landfills, contributing to the

release of CO2 and other GHGs. Currently, approximately 60% of food produced in Canada is wasted, with just over half of this quantity deemed as edible (Garnett, 2009). As food consumption continues to increase, mitigation of GHG emissions related to food waste may be insufficient in tackling climate change (Jackson, 2009). Further efforts must be made, such as through shifts in consumption patterns. For instance, it is known that efforts to incorporate more seasonal, local, and plant-based food sources in one's diet can decrease individual carbon footprint (Garnett, 2009). At a larger scale, food system-related GHG mitigation strategies can better be accomplished through improved coordination between production and retail stages, public awareness campaigns, and changes in packaging and labeling requirements (Garnett, 2009).

Presently, the City of Vancouver has made adjustments to policies and decision-making surrounding food waste and packaging. For example, a policy for single use cups and bag fees has been brought into effect January 1, 2022, in accordance with Vancouver's Zero Waste 2040 plan (City of Vancouver, 2021). Similarly, UBC has been attempting to incorporate climate-friendly food labeling measures, though has not been implemented or mandated on a larger scale (Campbell, 2022). When considering UBC's current proposed draft targets, it is evident that greater changes to food procurement strategies and consumption patterns ought to be made. Specifically, UBC is seeking to develop a CFFS by 2030, reduce food system-related GHG emissions by 50%, and produce 80% climate-friendly food menus in 2025.

We hope to be able to help UBC attain these goals through this community project. Generally, we aim to identify the highest impact areas surrounding food system-related GHG emissions as well as UBC Food Service's current food procurement methods and strategies. Through this, we hope to determine how UBC can develop food procurement strategies that implement reductions to foods waste and packaging, as well as changes to student consumptions patterns (ie. the promotion of sustainable, local, and plant-forward menu options). Secondly, we hope to acquire the perspectives of UBC students affiliated with climate councils and committees regarding current UBC climate action policies, menu options, food procurement, and labeling and packaging initiatives. Through this, we hope to identify the gaps present within UBC's current food system-related climate mitigation strategies, which may otherwise be filled by unique UBC student perspectives. Specifically, we would like to equip our clientele with the resources needed to effectively encourage sustainable dietary choices through campus-wide climate food

labeling, implement mandatory climate friendly food procurement guidelines by providers, and aid in the development of a Food Waste Reduction and Recovery Strategy. Finally, we hope that the progress made on this community project will inspire other post-secondary institutions and organizations to develop similar strategies to aid in the collective mitigation of food system-related climate change.

1.3 PROJECT CONTEXT

In tandem with the 2015 Paris Agreement, the EU's Farm to Fork (F2F) and Biodiversity Strategies (BDS) reduces consumer dependence on long-haul transportation (Farm Folk City Folk, 2021). This allows consumers to build a more resilient and sustainable food system which works towards mitigation targets established in the European Green Deal (Wolf et al., 2021). However, promoting local food as being inherently superior in reducing GHG emissions might handicap progress towards climate targets (Day-Farnsworth et al., 2014). According to Coley et al. (2001), consumers who purchased produce more than 6.7 km away had a similar carbon footprint to food procured from regional and large-scale suppliers (Plumptre et al., 2017). An increased dependence on local food production has been inextricably linked to food shortages that incur higher GHG emissions (Galt et al., 2019). Therefore, the simple binary of 'local is better' and 'conventional food procurement is worse' advances a reductionist view that fails to acknowledge the strengths and limitations of local food systems (Coley et al., 2001).

Increasing procurement of organic foods has led the City of Malmö to advance its development of sustainable food policies since 1997 (Smith et al., 2016). The "Policy for Sustainable Development and Food" was approved by the local government council in 2010, using a S.M.A.R.T. framework to improve health while remaining environmentally cautious (Smith et al., 2016; City of Malmö, 2010; City of Malmö, 2010). This approach ensures consumption of (S)maller amounts of meat, (M)inimizes intake of unhealthy and malnourished foods, prioritizes (A)n increase in organic foods, promotes the (R)ight sort of meats and vegetables, and champions (T)ransport efficiency (City of Malmö, 2010). According to Soldi (2018), "the proportion of organic food purchased" by the City of Malmö was 44 percent of all food, and this same proportion exceeded 50 percent in 2018. Similarly, the City of Vienna adopted a similar strategy by implementing more organic foods to transition towards a more sustainable food system (Soldi, 2018).

No simple statement on the sustainability of food systems is possible since GHG emissions are determined by many overlapping, multi-sectoral factors. Therefore, promoting local food as being inherently more sustainable does not address the broader issues of mistrust, increased competition, and loss of supplier autonomy (Plumptre et al., 2017). Additionally, advancing plant-forward options and campus sustainability initiatives still need to take into consideration behaviors, attitudes, and food preferences of students. We recognize that there is a need to examine the different complex and overlapping social, economic, and political factors that may impede GHG emission reductions on UBC's Vancouver campus. Therefore, this project will provide an opportunity to accelerate climate-friendly food procurement strategies to ensure that UBC's Vancouver campus is mitigating carbon emissions by promoting more resilient food procurement strategies.

1.4 PROJECT PURPOSE, GOALS AND OBJECTIVES

1.4.1 - Project Purpose:

The purpose of this project was to reduce campus food system-related GHG emissions and inform the development of supporting food procurement practices and strategies.

1.4.2 - Project Goals:

There were various goals aimed towards a strategy in reducing food procurement-related GHG emissions at UBC. First, we assessed and identified opportunities to reduce campus food procurement GHG emissions across the supply chain. Second, we hoped to inform the development of a campus-wide CFFS Procurement Strategy, with a focus on food GHG emissions reduction.

1.4.3 Project Objectives:

Our research objectives were designed to achieve our research goal and purpose, as listed above, and were composed of the following:

1. Identify promising practices of food procurement policies and practices that mitigate food GHG emissions within the food operations to inform further sustainable food operations at UBC.
2. Identify the most impactful opportunities for mitigating GHG emissions from UBC's food procurement strategies and practices.

3. Develop climate food procurement targets, indicators, and actions as part of a more comprehensive CFFS Procurement Strategy for the UBC Vancouver Campus.

2. METHODOLOGY AND METHODS

2.1 RESEARCH METHODOLOGY

A key principle of the Community-Based Action Research (CBAR) is to ensure involvement of stakeholders who are affected by the issues investigated and are included throughout the research processes. In our research, we applied this principle of inclusion by actively seeking input from the community, our instructors, the clients, and our team in order to guide our research in a cooperation-based manner, in order to work towards collective action in our research project. To complete the above goals, we operated by the "look-think-act" routine throughout our project in the following steps. For example, we designed our project focus, gathered and analyzed data, communicated our findings to our stakeholders, and finally developed a plan for implementing and evaluating our findings (Nasrollahi, 2015). We also were able to rely on our completed training courses and referred to them throughout our project.

2.2 RESEARCH METHODS

Regarding our primary data collection, our main methodological tool was gathering qualitative data through a focus group with the UBC Climate-Friendly Food Systems (CFFS) action committee, as well as interviewing key professionals at UBC working directly in food and sustainability efforts. The questions were produced and delivered to engage with personal and professional opinions regarding UBC's current practices in sustainable food procurement. We believed interviews with people related with UBC food services were necessary as it was very important to consider the supply-side perspective in implementing climate-friendly food systems. Together with the other student CFFS group projects, we recruited the CFFS action committee to engage in individualized questions concerning food procurement focused on GHG mitigation.

In terms of secondary data collection, practitioner literature reviews were conducted to inform one of the main objectives, identifying opportunities, frameworks and policies, and promising practices to reduce post-

secondary institutional food procurement emissions. Portals such as the UBC library online, Google Scholar, and the basic Google Search Engine, reliable peer-reviewed, governmental, and organization/institution-relevant sources were used for our research. Syntheses and analyses of such research were conducted individually, to answer specific research questions and knowledge gaps to inform our identified objectives.

2.2.1 SECONDARY DATA COLLECTION RESEARCH METHODS

Our secondary data collection was conducted during the completion of our environmental scan and academic research. Peer-reviewed articles, government publications, as well as other reliable sources were used to answer knowledge gaps and research questions that were identified through objective brainstorming. During our scan and research, we identified the most effective and desired areas for GHG emission reduction, opportunities for sustainable food procurement in a university setting, and promising practices for emission reduction. We conceptualized the efficacy of GHG emission mitigation strategies in other regions and other institutions to illustrate promising strategies for UBC's future sustainable food procurement strategies. This environmental scan was outlined through detailed literature reviews, covering main food system-related themes of locality and seasonality, dietary practices, transportation, and promising policies and frameworks. Key findings from the practitioner literature reviews were then compiled into a summarizing document, and illustrated as opportunities, frameworks and policies, and promising practices.

2.2.2 PRIMARY DATA COLLECTION RESEARCH METHODS

Our primary data collection consisted of qualitative data research, using a focus group and interviews, with developed scripts indicated in Appendix A, to inform the filling of many gaps in our research. First, the focus group was organized together with the other CFFS Procurement Strategy groups through the LFS450 course, engaging with the Climate Action Committee together via Zoom. Our rationale to have a CFFS Climate Action Committee focus group was because of the diversity within the committee, in a professional, experiential, and insightful sense. The participants consisted of chefs for UBC Food Services and Open Kitchen, SEEDS representatives, undergraduate

students, as well as others. Through randomized breakout sessions, with an allotted time of one hour to ask questions, we asked project-specific questions to the committee members. Using a developed script based on questions related to GHG emission mitigation (Appendix A.1), our group sought to inform our objectives with the personal and professional knowledge from committee members. With a sample size of n=13, we ensured to receive responses from each member by encouraging them to speak, giving a response rate of 100% (i.e., n=13). Each breakout session consisted of n=3 participants, with responses being recorded through meeting minutes and note-taking anonymously.

Further, interviews were conducted to engage in specific knowledge with two main stakeholders involved in sustainability and food procurement at UBC. The interviews were conducted via Zoom, with notes recorded by students in a Google Doc. Firstly, we contacted a member of the Open Kitchen team, based on a recommendation from our primary client, Victoria Wakefield. Their specific insights regarding UBC's food procurement practices, as well as their personal values were sought to inform main knowledge gaps from the literature reviews, with the interview having been conducted on March 15, 2022. Second, a member of the Climate Action Planning team for UBC was contacted as well, in hopes they would inform further considerations for sustainable food procurement, given UBC's context. This interview was conducted on March 22, 2022. The questions asked to both the March 15th and 22nd interviewees (Appendix A.2 & Appendix A.3, respectively) were produced by the identification of key knowledge gaps within the literature reviews, specifically regarding UBC's food procurement practices, and sought their professional and personal opinions on various subject matters.

2.3 METHODS OF ADMINISTRATION

2.3.1 Administration and Recruitment Process:

Our recruitment for our primary data collection was done through a few stages. Firstly, we followed a stratified non-random sampling method in terms of identifying various groups of individuals we would like to reach out to based on the desired attribute of having knowledge about UBC's food systems and relevant procurement channels (University of Guelph, 2013). Examples of our strata included members of: SEEDS Sustainability Program, UBC Campus & Community Planning, & UBC Food Services. From these groups we selected individuals based on

availability and relevant connections to our project. We also reached out to individuals recommended to us by our primary and secondary clients, and participated in a focus group that was organized by the SEEDS Sustainability Program alongside other LFS 450 groups.

2.3.2 Data Collection Timeline:

Our data collection loosely followed our Gantt Chart as set out in our research proposal, and was modified based on participant and our group's availability. Dates, duration, day of the week, mode of delivery for our primary data collection is set out in the chart below for both our interviews and focus group:

Type	Date	Duration	Day of the Week	Mode of Delivery
Focus Group	March 11th, 2022	1 hour	Friday	Online via Zoom
Interview	March 15th, 2022	1 hour	Tuesday	Online via Zoom
Interview	March 22nd, 2022	1 hour	Tuesday	Online via Zoom

2.3.3 Data Collection Locations:

We collected data and notes transcripts during our interviews and focus groups in a google document shared between just our group members to allow for collaboration within the group. To ensure UBC's privacy standards are being met, we did not store any personal information of the participants in the google documents, and instead labeled them using the dates of the interviews and focus groups (University of British Columbia, 2016). The names of participants were stored offline in an encrypted document on a group member's computer, and later matched the data and names for this report. We then transitioned the raw interview scripts without any identifying personal information to the ATLAS.ti 22 software for coding and analysis.

2.3.4 Rationale for Data Collection:

The rationale for our primary data collection originated from a desire to fulfill our project purpose, in that we are aiming to reduce campus food system-related GHG emissions by informing the development of supporting food *procurement* practices and strategies. We decided to use interviews and focus groups over electronic surveys

because of the scope of our project, and because of what we wanted to gain from our primary data collection. Firstly, since our focus is on the procurement side of the food system, we did not focus on the consumption side since it was outside of our scope. The consumption side would have benefited from the student perspective, which requires a larger sample size, and therefore would have made electronic surveys a more appropriate option for its potential to reach large groups. A focus on the procurement side lends itself to a lower sample size, and therefore we felt it was more appropriate and feasible to use interviews and surveys.

Secondly, our choices of data collection methods also better enabled us to have in-depth conversations with individuals on their perspectives on reducing GHG emissions, as we were able to ask follow-up questions and clarifying questions. Focus groups allowed us to gain the perspectives of many individuals in the same organization at the same time, which was more efficient for us with a condensed project timeline. Interviews were useful in gaining more in-depth data on relevant food procurement practices and strategies with individuals working closely in UBC's food system

3. RESULTS

3.1 PRIMARY DATA COLLECTION

ATLAS.ti 22 software program was used to code and analyze focus group discussions and meeting notes. Predetermined codes (transparency, food security, incentivizing plant-based/de-incentivizing meat, monitoring progress, organic, seasonality/locality, student involvement) were established prior to running our thematic analysis, based on our conversations with clients and UBC food system stakeholders. We began by analyzing each document's text and coding its sentences based on the category that we felt it best aligned with. For example, our March 22nd interview touched-on important themes of transparency, seasonality, and locality. When asked about how well aligned UBC and UBC Food Services are with the goals of the current CAP 2030 and the recent UBC Climate Emergency Declaration, he suggested creating menu changes to incorporate more climate-friendly (CF) foods and plant-based alternatives. This was coded under the tag of incentivizing plant-based / de-incentivizing meat.

We manually repeated this process for interviews that were held on March 15th, March 22nd, and the focus group held on March 11th. After correlating the appropriate text with its corresponding theme, we ran a Code-Document Table cross tabulation. This allowed our group to visualize the qualitative data that we had collected in the form of a table and bar graph. Additionally, we calculated absolute frequencies and table relative frequencies for each group. We ran the Count Codes analysis to display the number of quotations coded for each predetermined theme as well as the Count Words analysis to display the frequency of words under each category. Lastly, we generated a Words Cloud for each interview or focus group discussion in order to create a visual representation of our data. This process was repeated for each day that we had collected raw data. Results from each transcription data were then amalgamated and analyzed using the Count Codes analysis with ATLAS.ti 22 software.

3.1.1 FOCUS GROUPS

A multitude of themes surrounding food system-related GHG emissions were discussed during the focus groups. Fig. 1 depicts the proportion of related themes that were discussed by participants (n=13) across all three breakout rooms. Most notably, incentivizing plant-based foods and de-incentivizing animal-based foods (35.9%), monitoring progress (33.7%), and transparency (12.5%) were the most heavily discussed topics.

	Food Securi... 5		Incentivisin... 29		Monitoring... 16		Organic 6		Seasonality... 17		Student Inv... 10		Transparency 15		Totals	
4: March 11th 44			436	35.88%	409	33.66%	11	0.91%	122	10.04%	85	7.00%	152	12.51%	1215	100.00%
Totals	**0**	0.00%	**436**	35.88%	**409**	33.66%	**11**	0.91%	**122**	10.04%	**85**	7.00%	**152**	12.51%	**1215**	100.00%

Figure 1. The proportion of responses received by focus group participants concerning the following themes: food security, food literacy, incentivizing plant-based foods and de-incentivizing animal-based foods, monitoring progress, organic, seasonality and locality, student involvement, and transparency. The bar graph depicts the relative number of occurrences that each theme was discussed by participants.

3.1.2 INTERVIEWS

The prevalence of themes discussed in the two interviews conducted on March 15th and 22nd are depicted below in Figure 2 and 3, respectively. The themes have been categorized to be consistent with those identified in the focus groups, and include: food security, food literacy, incentivizing plant-based foods and de-incentivizing animal-based foods, monitoring progress, organic, seasonality and locality, student involvement, and transparency. The top three most prevalently discussed themes from the first interview included incentivizing plant-based foods and de-incentivizing animal-based foods (31.2%), seasonality and locality (15.6%), and organic food (15.6%). On the other hand, the most prevalently discussed themes from the second interview included transparency (25%), as well as an equal distribution of discussion regarding incentivizing plant-based foods and de-incentivizing animal-based foods, monitoring progress, seasonality and locality, and student involvement (18.8%).

	Food Insec... 3	Food Literacy 3	Incentivisin... 10	Monitoring... 1	Organic 5	Seasonality... 5	Student Inv... 3	Transparency 2	Totals
1: March 15th Interview Notes 31	3 9.38%	3 9.38%	10 31.25%	1 3.13%	5 15.63%	5 15.63%	3 9.38%	2 6.25%	32 100.00%
Totals	3 9.38%	3 9.38%	10 31.25%	1 3.13%	5 15.63%	5 15.63%	3 9.38%	2 6.25%	32 100.00%

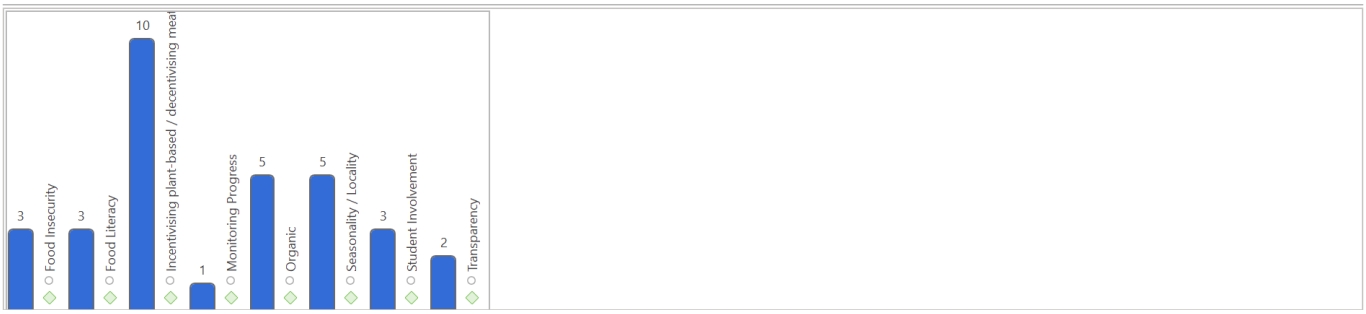

Figure 2. The proportion of responses received by our March 15th interviewee (a representative from UBC Food Services) concerning the following themes: food security, food literacy, incentivizing plant-based foods and de-incentivizing animal-based foods, monitoring progress, organic, seasonality and locality, student involvement, and transparency. The bar graph depicts the relative number of occurrences that each theme was discussed with the interviewee.

	Food Insec... 3		Incentivisin... 13		Monitoring... 4		Organic 5		Seasonality... 8		Student Inv... 6		Transparency 6		Totals	
2: March 22... 15			3	18.75%	3	18.75%			3	18.75%	3	18.75%	4	25.00%	16	100.00%
Totals	**0**	0.00%	**3**	18.75%	**3**	18.75%	**0**	0.00%	**3**	18.75%	**3**	18.75%	**4**	25.00%	**16**	100.00%

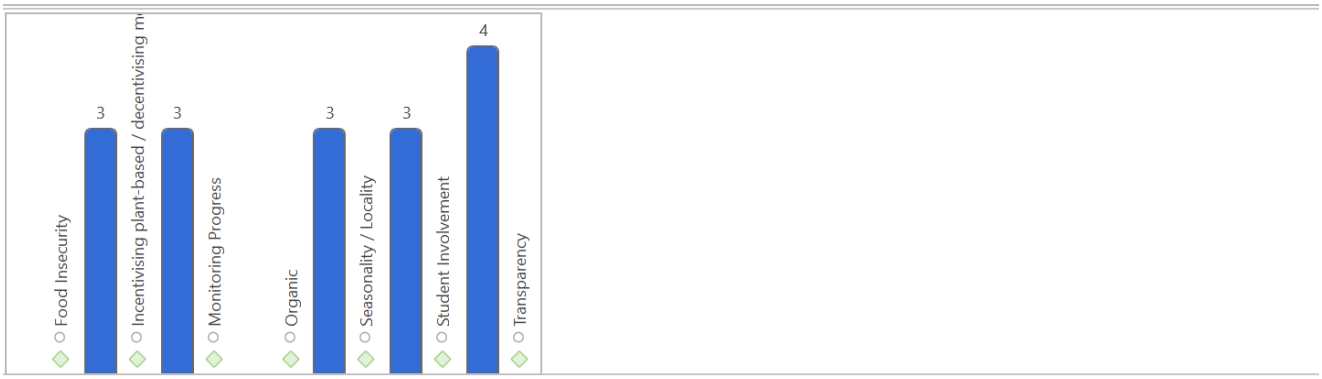

Figure 3. The proportion of responses received by our March 22nd interviewee (a representative from UBC Campus & Community Planning) concerning the following themes: food security, food literacy, incentivizing plant-based foods and de-incentivizing animal-based foods, monitoring progress, organic, seasonality and locality, student involvement, and transparency. The bar graph depicts the relative number of occurrences that each theme was discussed with the interviewee.

3.1.3 Combined Results from Focus Groups & Interviews

Findings obtained from both focus groups and interviews were compiled to provide an overview of the main themes that were discussed throughout. Figure 4 depicts the proportion of responses obtained by all focus group participants and interviewees in the same order as above. The top four most prevalent themes discussed include incentivizing plant-based foods and de-incentivizing animal-based foods (29.6%), seasonality and locality (17.4%), and monitoring progress (16.3%). The findings from the discussions pertaining to the following three themes will be expanded on below, and will be used to frame our discussion.

	Food Security 5		Incentivising plant-based... 29		Monitoring... 16		Organic 6		Seasonality... 17		Student Inv... 10		Transparency 15		Totals	
1: March 15t... 31	3	10.34%	10	34.48%	1	3.45%	5	17.24%	5	17.24%	3	10.34%	2	6.90%	29	100.00%
2: March 22... 15			3	18.75%	3	18.75%			3	18.75%	3	18.75%	4	25.00%	16	100.00%
3: Meeting w... 7	2	25.00%			2	25.00%			3	37.50%	1	12.50%			8	100.00%
4: March 11th 44			16	35.56%	10	22.22%	1	2.22%	6	13.33%	3	6.67%	9	20.00%	45	100.00%
Totals	**5**	5.10%	**29**	29.59%	**16**	16.33%	**6**	6.12%	**17**	17.35%	**10**	10.20%	**15**	15.31%	**98**	100.00%

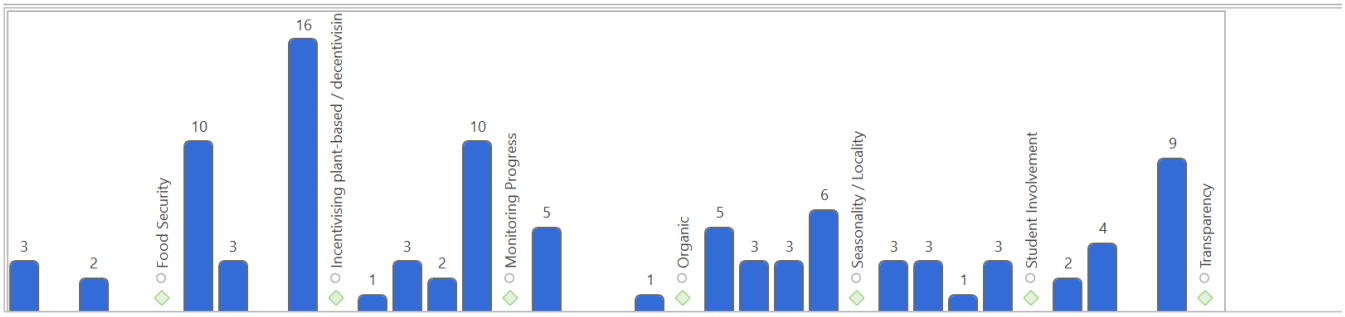

Figure 4. The proportion of responses received by all focus groups participants and interviewees concerning the following themes: food security, food literacy, incentivizing plant-based foods and de-incentivizing animal-based foods, monitoring progress, organic, seasonality and locality, student involvement, and transparency. The bar graph depicts the relative number of occurrences that each theme was discussed with the interviewee.

3.1.3 COMMON THEMES

PLANT-BASED

All focus group participants and interviewees were asked a similar universal question: “What is the highest impact area that needs to be addressed in order to successfully mitigate our food-system related GHG emissions?”. An overwhelming amount of the responses received were centered around plant-based/forward diets and dietary shifts, specifically regarding increasing the quantity and quality of metrics that can be used to quantify the proportion, cost, and accessibility of foods that are plant-based. Participants argued that plant-based options can be seen as a ‘triple win’, insinuating that they are better for the planet (i.e. through contributing to a reduction in GHG emissions), human health, and are more financially affordable.

Our first interviewee (a representative from UBC Food Services) contributed some statistics regarding UBC’s current plant-based initiatives. Our group was informed that UBC Food Services’ entree offerings across the campus’ three main dining halls are 46% plant based, with this target anticipated to increase to 60% by the end of 2022. The interviewee emphasized the prevalence of plant-based options that exist at UBC, and that Food Services has begun

to audit their menu offerings to quantify the percentage of plant-based foods across all services. Despite this, they proposed that changes in promotion, consumer acceptance, and education ought to be made. Specifically, they mentioned that student 'nudge' or educational campaigns are integral to fostering a stronger understanding about why plant-forward diets are necessary to tackling climate change. Further, it was mentioned that students are capable of taking actionable change through improving their plant-based culinary skills and engineering their daily consumption patterns to incorporate more plant-based options.

Beyond educational campaigns and culinary training, participants stated the importance of increasing the appeal of plant-based offerings. For instance, it was suggested that loyalty card programs may be a feasible way of incentivizing plant-based food purchases (i.e. purchase 10 plant-based meals, get 1 free), as well as de-categorizing foods as 'plant-based' or 'vegan' with the aim of normalizing these options.

SEASONALITY AND LOCALITY

One of the other most common responses from our interviewees when asked about the highest impact area that needs to be addressed in order to successfully mitigate our food-system related GHG emissions was procuring foods that are local and seasonal to British Columbia. Our respondents emphasized that UBC prioritizes local procurement, which is reflected by the fact that in 2019, prior to the COVID-19 pandemic, 62% of UBC's food was locally sourced (within 400 km of the Point Grey campus).

In order to determine if emissions saved from transportation are an important factor in reducing GHG emissions within procurement, we asked our respondents if locality is always a significant area for GHG emission reduction. A respondent from UBC Food Services reported that previous research that they conducted with a student group from the Sauder School of Business indicated that there were greater adverse environmental impacts from purchasing food locally, especially when focusing solely on GHG impacts when compared to procuring foods elsewhere. However, our respondents also pointed out that there are other "holistic" benefits to local food procurement such as the economic benefits of supporting local producers. The respondents therefore pointed out

the importance of finding a balance between the economic factors and environmental impact factors that may accompany local food procurement.

MONITORING PROGRESS

According to UBC food stakeholders, the theme of monitoring progress and ensuring accountability at the decision-making level is an integral part of the university's on-campus food system. This was most evident during our focus group when participants voiced the importance of measuring the university's animal protein and vegetable purchases (Appendix B.1). Several individuals suggested developing a climate change accountability report as well as requirements to measure waste, report food waste, and share data with stakeholders. Additionally, creating an action group that examines UBC's Food Charter will allow for external guidance by building an association of UBC Food and Beverage Operators.

When asked whether the campus has been actively reducing and monitoring its GHG emissions, it was unanimously agreed that the impact of UBC's food emissions have been largely ignored. This is problematic for a campus that is considered number one in the world for taking urgent action to combat climate change, according to the *Times Higher Education Report* (Ramsey, 2019). That said, UBC is currently taking action by focusing on climate-friendly food labeling. Not only does this increase transparency, but it also provides an opportunity for UBC food stakeholders to monitor progress towards the CAP 2030 goals.

3.2 SECONDARY DATA COLLECTION

The analyses were separated into opportunities, frameworks and policies, and promising practices as outlined in the sections below.

3.2.1. PLANT-BASED

An analysis of peer-reviewed literature surrounding the relationship between dietary composition and GHG emissions was conducted. It was found that approximately 10-12% of all global anthropogenic emissions are

associated with the agricultural industry, with the rearing of livestock accounting for 80% of these total emissions (Garnett, 2009; Chai et al., 2019). Most notably, red meat and dairy contribute to these emissions as two of the highest impact groups (Chai et al., 2019). These two agricultural outputs are associated with 8-fold greater GHG emissions than plant-based foods, such as grains and legumes (Gonzalez et al., 2011).

Globally, many nations, communities, and individuals have been making efforts to adopt policies and plant-forward practices. According to the EAT Lancet Commission, "plant-forward" can be defined as "appropriate caloric intake, an abundance of diverse plant-based foods, low amounts of animal-based foods (especially red meat), unsaturated fats in place of saturated fats, and limited refined grains, processed foods, and added sugars (Willett et al., 2019). It is speculated that if the majority of the population makes these dietary alterations, global GHG emissions can feasibly be reduced by over 56% (Godfray et al., 2018). With the goal of increasing plant-forward consumption patterns, Canada has accommodated shifts to their recommendations outlined in the national Food Guide, such as promoting the incorporation of more fruits and vegetables into one's diet (Health Canada, 2019). These recommendations are not only being put forth with human and environmental well-being in mind, but with the aim of informing the development of future nutrition policies focused on the mitigation of GHG emissions (Health Canada, 2019).

The literature indicates that plant-forward policies are relatively scarce at the moment, though emphasizes several recommendations for implementing sustainable, long-term policies. For example, Garnett states that policies ought to encompass a wide range of sectors, including agriculture, trade, health, urban planning, and public procurement and consumption (2009). Moreover, it is suggested that food systems must focus on improving productivity while simultaneously reducing livestock numbers and changing the management system of outputs (Garnett, 2009). Notably, food retailers ought to focus on purchasing foods according to their position on a 'GHG emission hierarchy' (Garnett, 2009).

Several promising plant-forward practices have been identified within the literature, especially at the level of educational institutions. Most notably, an initiative undertaken by the Oakland Unified School District involved conducting a pilot analysis of the district's food programs, and consequently implemented several changes to incorporate climate-friendly menu options (Hamerschlag et Kraus-Polk, 2017). A two-year food procurement

strategy was implemented, which reduced purchases of animal-based products by 30%, and increased fresh produce purchases by 10%. Overall, the district was able to save over $42,000 annually on school meals, all while improving student satisfaction of menu offerings (Hamerschlag et Kraus-Polk, 2017).

3.2.2. SEASONALITY AND LOCALITY

A literature review of current Canadian GHG transportation emissions used the Policy Commons database and CAB Direct (from the UBC Library). Key terms, such as “food distribution strategies”, “GHG emission policies”, and “Canadian transport guidelines” were used to determine a broader vision of mitigation policies in Canada. Several trends emerged, including how increasing distance between producers and consumers contributes to changes in consumer behavior and supply challenges. Studies also reveal that minimizing the distance that fresh foods travel can help reduce environmental pollution and increase nutritional benefits.

Previous research suggests that the analysis of transport GHG emissions requires a comprehensive understanding of the various financial, institutional, cultural, and legal barriers that impede mitigation strategies in Canada (Ross & Mason, 2020). Several indicators, such as fuel consumption and comparison of travel modes, can identify areas of potential improvement. It should be noted that regional differences in policy instruments and provincial frameworks have led to discrepancies in GHG emissions (Sims et al., 2014). This has led to incongruence between consumer beliefs, supplier attitudes and government policies throughout Canada (Ross & Mason, 2020). To reach Canada’s current objective of reducing 40-50% of carbon emissions, it is recommended that multidisciplinary solutions be undertaken by consumers, suppliers, and policymakers (Sims et al., 2014). Therefore, a more comprehensive and robust assessment of GHG emissions is needed to improve transportation efficiency within Canada’s current agri-food system.

According to Coley et al. (2009), consumers who rely on local suppliers might produce more GHG emissions than those who procure food elsewhere. It was found that a consumer who purchased produce more than 6.7 km away had a similar carbon footprint to food procured from regional and large-scale suppliers (Plumptre et al., 2017). While Coley et al. (2009) notes that this might not always be the case due to discrepancies in geography and transportation policies. Promoting local food as being inherently superior in reducing transport GHG emissions

might handicap progress towards climate targets (Day-Farnsworth et al., 2014). Galt et al. (2019) notes that community supported agriculture (CSA) models use a simple binary of 'local is better' and 'conventional food procurement is worse' to gain consumer support (Coley et al., 2001). An increased dependence on local food production has been inextricably linked to food shortages that incur higher GHG emissions (Galt et al., 2019). To shift away from this reductionist view of food transport systems,it is speculated that consumers should acknowledge the strengths and limitations of local transportation networks, as we will discuss in our results.

3.2.3 OTHER RELEVANT FINDINGS

There were various other findings with our peer-literature reviews that were promising opportunities, frameworks and policies, and practices that weren't within the scope of our strategy, yet were as significant as the ones that were highlighted above. Other main opportunities were highlighted as menu, food supply-chain, and emissions transparency (Wolf et al., 2021; Alberdi & Beirstain-Zubillaga, 2021; UBC, 2021)

Key frameworks and policies that have been initiated in other regions informed many promising strategies for our research. For example, the Sustainable Food Procurement Strategy (SFPS) was identified as a promising institutional framework, which specifically emulated multilevel governance, multidisciplinarity, healthy and sustainable diets and food services, and a sustainable food supply system supported by specific criteria relevant to the type institution and region it was placed in (Alberdi & Beirstain-Zubillaga, 2021). Considerably, the SFPS valued menu transparency of food footprints and nutritious options, and monitoring through evaluation of menu satisfaction, as well as other strategies relevant to the healthcare food system (Alberdi & Beirstain-Zubillaga, 2021). Finally, the in Alberdi & Beirstain-Zubillaga's (2021) literature, they concluded that a successful SFPS encompasses a holistic approach, holding long-term commitments in economic investment, evaluation and monitorization, strategy development for communication and awareness, and consideration of gendered implications and social consequences within the systems.

4. DISCUSSION

4.1. PLANT-BASED

In terms of examining our plant-forward results, although we expected that promoting plant-forward options would be a notable topic within our data collection, we received more responses in this area than anticipated. This made up a large portion of our primary data, and was supported by our secondary data collection, as noted in our results section. The large extent that this is mentioned in our primary and secondary data indicates that utilizing plant-based menu options at UBC is a significant area to focus on, especially since it is a high impact method for reducing GHG emissions, aids in the health of people, and is more financially affordable. This speaks to our project purpose, goals and objectives, in that the practices and strategies of promoting plant-forward menu options are a viable method of reducing campus food system-related GHG emissions.

Our primary and secondary data collection advanced understanding of our research opportunity, in that we have identified next steps to take in promoting plant-forward menu offerings at UBC. We must acknowledge that steps are already being taken at UBC to promote plant-forward, such as being already 46% plant-based and aiming to reach 60% by 2022. Based on our secondary data collection we believe that the next step for UBC is to incentivize the consumption of plant based foods through educational and nudge campaigns, because if the consumer population is able to accept these changes, this can inform and affirm UBC's procurement strategy shifts to more plant-based menu offerings. This is supported by our primary data, which mentioned that small incremental changes and incentives were key to consumer acceptance.

What was also noted in our primary and secondary data is that when implementing such changes to their menu offerings, institutions such as UBC must keep in mind the financial accessibility, cultural appropriateness, and pre-existing values and beliefs surrounding food to ensure that the implementations will have a desired positive impact on the UBC community as well (Lea, 2006).

4.2 MONITORING

Based on several discussions with UBC food stakeholders, we found that monitoring progress towards achieving the CAP 2030 recommendations was an emerging theme throughout our qualitative datasets. Most notably, this included reporting accurate, consistent, and internationally comparable data on GHG emissions

throughout UBC's on-campus food system. Several participants suggested increased collaboration among faculty, staff, AMS, and other climate groups to bring diverse perspectives to the forefront. In doing so, this would allow UBC to advance its commitment to equity, diversity, and inclusion. It was surprising to learn that no existing equity measures have been implemented on the campus's existing food system. Therefore, stakeholders recommended mitigating this issue by involving a diverse and interdisciplinary action group to examine how well-aligned current strategies are with UBC's Food Charter.

In the context of UBC, students are already willing to incorporate more climate-friendly foods into their diets. However, current food literacy and climate awareness initiatives are necessary for engaging more students in current discussions. In tandem with our secondary data analysis, there exists several unique opportunities to implement various frameworks and policies, similar to those that we found in other regions. For example, UBC has the ability to develop a climate change accountability report and carbon metrics to monitor progress. This is similar to the Sustainable Food Procurement Strategy (SFPS) which we identified as a promising institutional framework to involve multilevel governance, multidisciplinarity, healthy and sustainable diets and food services (Alberdi & Beirstain-Zubillaga, 2021). By integrating more multidisciplinary voices and monitoring UBC's current strides towards mitigating carbon emissions, the university has the ability to reach its proposed GHG emission targets by 2030. This was reflected in the conversation that we had with various food stakeholders who regularly engage with UBC's foodscape.

4.3 LOCALITY

During our data collection, there was much emphasis placed on the importance of procuring food locally. The most common response we received regarding impactful opportunities for GHG mitigation was identified as local procurement. However, this is where we found a lot of conflicting evidence, especially between our primary and secondary data. Conclusively, our secondary data did not support this claim and suggested that local being perceived as better is a misconception (Day-Farnsworth et al., 2014). However, through our primary data collection, our respondents emphasized the noteworthy holistic benefits of local food procurement, such as supporting local suppliers and the broader economy in British Columbia, which is certainly an important consideration.

There are various justifications as to why local is not always better. First, different modes of transportation account for less significant amount of emissions in the food system, equating to approximately 10% of food system-related emissions; whereas, production practices, land use change and the type of food being produced account for considerably more emissions than distribution does (Ritchie, 2020). Notably, the literature showed that there is nothing inherently good about local methods of production, wherein conventional, intensified agribusiness models can be inherently more detrimental to environmental and social considerations (Born & Purcell, 2006). Consequently, many times, eating locally procured foods might increase emissions if the food is grown out of season and in unfavorable conditions, whereby production practices create more emissions than those from storage (Ritchie, 2020). For example, procurement of organic foods were heavily emphasized as key in many frameworks found in the literature reviews, like in the SFPS model (Alberdi & Beirstain-Zubillaga, 2021) were deemed more sustainable through small scale production; however, intensified organic production did not indicate less emissions than 'conventional' farming (Röös et al., 2021). Therefore, we wish to reiterate that considerations such as local and organic food procurement must be evaluated together with other sustainability elements as well, holistically.

Seemingly, procuring foods from international sources can often be more sustainable and cost effective than forcing growth in unnatural environments (Ritchie, 2020). Furthermore, global sourcing can help promote the creation of fair trade products through sourcing agreements. There is no reason to assume why distant producers are less sustainable or have less just social relations than local ones, and they can also economically benefit from such opportunities (Born & Purcell, 2006).

Overall, we would like to caution the notion that locality is better in terms of GHG emissions, because many times, it is less impactful than presumed. We would rather encourage a balance of local and global procurement and approach this subject on a case-by-case basis.

4.4 OVERALL DATA LIMITATIONS

In terms of overall data limitations, we must acknowledge that we are limited by a smaller sample size, limited scope, and biased sampling. Firstly, our total sampling size for our primary data collection was n=15, which is relatively small in comparison to the large number of people working in areas relevant to UBC's food

procurement, which means that our data had the potential to be skewed. We did try to remedy this by using stratified sampling to ensure that a variety of strata were incorporated, but it is a limitation nonetheless. Secondly, in order to stay within our project scope and our project purpose, goals, and objectives, we were only able to focus on the reduction of GHG emissions on the *procurement* side of UBC's food system. Therefore, our data was limited in that it would have been useful to also focus on the consumer and student perspectives. Thirdly, since our project was conducted within a relatively short timeframe, we had to prioritize our primary data recruitment so that we would be able to most effectively identify the most high impact areas for reducing GHG emissions in UBC's food system. With this in mind we tended to recruit individuals who were in similar fields of work and research, which limited our sample size, and may have introduced biases into our data collection. For example, individuals who were already working in the field may have inherent biases as opposed to someone knowledgeable about GHG emissions that is external to UBC.

5. RECOMMENDATIONS

Please refer to our CFFS Procurement Strategy for additional recommendations for action and implementation based on our primary and secondary data collection. There, we have outlined targets, actions, and indicators that we believe to be relevant to our project clients and stakeholders in reducing GHG emissions at UBC.

5.1 RECOMMENDATIONS FOR ACTION AND IMPLEMENTATION

5.1.1 SHORT-TERM RECOMMENDATIONS

Recommendation #1: Increase the appeal and incentivization of plant-based foods

UBC has taken and continues to take great strides in shifting to a plant-based menu, which is reflected by their goal of 60% plant-based offerings within the three main residence dining halls by the end of 2022. We believe the greatest impact area for decreasing GHG emissions lies in shifting the consumer's demand for plant-based meals. By doing so, there will be an increased procurement of plant-based foods, and less animal products, leading

to a decrease in GHG emissions of the food procured by UBC. In order to normalize this shift towards plant-based diets among the student population we recommend that the following steps are taken:

- **Ensure plant-based meals are more financially accessible for students**

One of the barriers preventing students from accessing plant-based meals according to our interviewees is that plant-based meals are at a close price point to animal-based meals, often discouraging students from choosing plant-based meals over other options. This recommendation is especially important since a 2018 study conducted by the Alma Mater Society revealed that 42% of UBC students experience food insecurity (Sutton et al., 2020). It is therefore necessary to ensure that students are incentivized to purchase plant-based foods by making plant-based foods more financially affordable. Some ways to achieve this as discussed by interviewees is by taking a smaller profit margin on plant-based dishes and a higher margin on the less environmentally friendly foods/meals. We also recommend the implementation and expansion of rewards systems such as loyalty punch cards for plant-based meals, where students are given a free plant-based meal after 5 or 10 purchases. We recommend expanding these rewards systems to more dining halls and food providers at UBC.

- **Avoid advertising/categorizing meals as "plant-based"**

Our Interviewees emphasized the importance of avoiding advertising meals as "plant-based meals", "vegan" or "vegetarian". Rather, meals should be named and adversitied in ways that makes the dishes appealing and focuses on the attributes and flavors of the meal in order to increase its appeal and promote their consumption. A great example of this strategy is offered by the DefaultVeg organization which can be found in Appendix C. Their menu features plant-based meals as the default option, while giving consumers the choice to add meat and/or dairy upon request. By changing the default, consumers are much more likely to choose a plant-based meal, even if meat and dairy options are available. However, it is also necessary to still use icons to identify vegan/vegetarian meals in order to ensure that they are identifiable for those with dietary preferences and restrictions.

- **Collaborate with dieticians to increase education about plant-based nutrition**

One of the barriers discussed in our primary data that prevents students from consuming plant-based foods is the assumption that plant-based foods contain less protein. However, according to our interviewees, this is not necessarily true, and plant based food can provide sufficient amounts of protein. Therefore, it is necessary to

educate consumers about the nutritional benefits of plant-based dishes. This can be implemented with collaboration and education from Dieticians through educational campaigns on campus in order to increase students' willingness to purchase plant-based meals. We also recommend that dieticians collaborate with chefs in creating plant-based meals in order to ensure that plant-based meals are nutritious and provide complete proteins.

- **Increase nudge campaigns and educational campaigns to increase food literacy among students at food purchasers at UBC**

A heavily discussed strategy for increasing plant-based food consumption discussed by our interviewees is to increase education on the importance of choosing plant-based foods. We therefore recommend the implementation of nudge and education campaigns that educate the UBC community about the relationship between the ongoing climate crisis and dietary consumption. We also suggest implementing educational programmes and encourage UBC food purchasers to conduct external research regarding increasing the appeal of plant-based menu offerings (i.e. what university students are most receptive to).

Recommendation #2: Develop a climate change accountability report as well as GHG benchmarks

Create carbon metrics to inform UBC's decision-making when selecting food partners. This can be done by developing an action group that examines UBC's Food Charter and establishes important values and guidelines that align with the UBC Vancouver campus's vision for a more climate-friendly food system.

Recommendation #3: Promote menu switches that align with lower GHG emitting food products

We recommend that in collaboration with dining halls and AMS food services, menu switches should be implemented that contain more plant-based ingredients. This can be implemented together with the UBC Climate-Friendly Food Label, and signage should be implemented indicating which items are more sustainable using the GHG emissions related food hierarchy. We also recommend using the 'Carbon-Dioxide-equivalents,' from Ritchie (2020) metric to develop a standard in which it's still sustainable to procure meat to fulfill nutritional and cultural values; however, reducing the procurement, and thus, consumption, to motivate engagement with plant-forward frameworks (See Appendix C). We also recommend the implementation of 'Meatless Mondays' across UBC dining

halls, which has been shown to be a successful way to increase motivation for plant-based meals (Milford et Kildal, 2019).

Recommendation #4: develop a food procurement assessment tool that utilizes multiple metrics to discern the sustainability (economic, social, & environmental) of the food procured at UBC

Instead of assuming that local food is more sustainable, a framework should be developed to assess the environmental, social and economic factors that accompany food production. We caution against using a certain metric to base all food procurement decisions on, and rather recommend a holistic approach and the use of multiple metrics to assess the sustainability of the food procured.

5.1.2 LONG-TERM RECOMMENDATIONS

Recommendation #5: Increase monitoring of food waste to inform a more effective procurement strategy which produces less food waste and therefore less GHG emissions

In order to decrease food waste (and therefore GHG emissions), categories of post-consumer food produced in residence dining halls should be monitored in order for UBC Food Services to identify which categories are wasted often. This data should be collected to inform a procurement strategy and menu offering that take into account potential food waste based on consumer's purchasing behavior and food quantities being consumed.

Recommendation #6: Increase funding to develop metrics that can monitor the GHG emissions associated with individual meals and make these values accessible to both UBC students and food purchasers/providers.

In collaboration with UBC Sustainability & Engineering Services (a unit of UBC Campus & Community & Regional Planning), metrics should be developed to analyze the carbon footprint of individual meals. This is to be included as part of UBC Food Services' standard Point of Sales (POS) system. We recommend developing a 'customer carbon tool' accessible to UBC students, displaying a quantified value of their purchases in terms of greenhouse gas emissions. Changes in the purchasing habits of students can be used to inform procurement by UBC Food Services.

Finally, all food purchases should be aggregated into equivalent GHG emissions and added to UBC's annual Carbon Report (Climate Change Accountability Report).

Recommendation #7: When sourcing locally, identify farms to procure from based on a series of CFFS metrics

If a food is procured within BC, we recommend identifying and purchasing from the most environmentally sustainable farms. We recommend that local farm practices are assessed based on a set of predefined metrics that measure GHG emissions and assess the sustainability of farming practices to ensure that the foods that are procured offer the lowest GHG emissions in their production. This can be achieved by collaborating with SEEDS, LFS professors, or through consulting academic research to identify the best farming practices that lead to the least GHG emissions. These findings should then be used to develop a framework of best production and farming practices that emit the least GHG emissions in their production in order for UBC Food Services to have as a reference of which producers offer the most sustainable products. As mentioned above, other considerations, such as working and labor conditions should also be considered when assessing sustainability of products.

5.2 RECOMMENDATIONS FOR FUTURE RESEARCH

Through our project we were able to identify various opportunities for further research to properly apply future sustainable food procurement strategies. First, there was insufficient evidence of established criteria outlining how to sustainably procure food, specifically mentioning how to quantify impacts from locality, farming practices, and the food product implications. Developing a proper criteria set that indicates how to assess each key consideration in food procurement can be useful in identifying the most sustainable options for certain food products. Second, we suggest administering surveys to student consumers to gauge their current outlooks on plant-based options at UBC. This can allow them to voice their opinions and concerns, especially on what they think is efficient and inefficient as menu shifts. Finally, we suggest that UBC conduct more research on which specific foods that are procured create the most amount of detrimental impacts. Developing metrics for this might be indicated by quantifying their food-related GHG emissions associated with individual meals.

6. CONCLUSION

Overall, the findings of our project reveal the strengths, limitations, opportunities, and challenges that UBC is facing on their path towards curating a climate-friendly food procurement strategy. Our group has identified the broad steps being undertaken, such as increasing the proportion of plant-based menu offerings, increasing transparency of menu offerings, prioritizing local food procurement, and monitoring the overall GHG emissions associated with its food system. Despite such promising efforts, we have identified and outlined several areas where recommendations may be implemented. For example, increasing food literacy among both students and staff within UBC Food Services, such as through educational campaigns and workshops. Moreover, further resources and collaboration are necessary for developing novel metrics that can quantify the precise GHG emissions associated with individual menu items. Finally, a more holistic approach to sustainable food procurement ought to be developed, such as considering factors beyond locality. We strongly believe that our CFFS procurement strategy, informed by our primary and secondary research results, will prove valuable to our clients when furthering these initiatives.

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APPENDICES

APPENDIX A - PRIMARY DATA COLLECTION SCRIPTS

APPENDIX A.1 MARCH 11, 2022 FOCUS GROUP

AGENDA

1. Groups 2 & 3 make introductions.
2. General question for the entire group: What are the most relevant key indicators that a university can assess to understand its food-related procurement impact?

Breakout Room Number	Questions
1	1. From a climate mitigation perspective, what are the top & most innovative actions the university could take through its food procurement policy that can contribute to assessing and reducing GHG emissions (e.g. reducing food waste, encouraging plant-based meals)? 2. How we can make these strategies and incentives more accessible for students? 3. What are the best ways to measure the impact of these actions? 4. What do you currently know about UBC's food procurement practices, where should we be focusing in terms of highest impact? 5. How can a robust management framework be put in place to support climate-friendly mitigation? 6. What is the most feasible/reasonable approach in implementing a valuable strategy? 7. How can we shift attitudes regarding plant-forward alternatives in practice? 8. How much of the food at UBC is procured locally?
2	1. What do you think is the best way to advance sustainable food procurement at UBC? 2. What is the most effective way of promoting plant-based meals? 3. Any other successful practices across other institutions? 4. What is the effectiveness of mock meats/vegan chicken nuggets? 5. Is UBC doing anything to quantify or measure food impacts? 6. What is UBC doing to assess GHG emissions other foods? 7. Is it considered that local is always better, or are there foods that are better to procured not local?
3	1. What is the best way to reduce GHG emissions at UBC's food system? 2. Do you have a hierarchy of most important facets to tackle first? 3. What is a good method of promoting plant-based foods and reducing food waste? 4. How can we make plant-based more accessible? 5. Are you aware of other sustainable food procurement practices in an institutional setting? 6. What is the best way of involving the most amount of stakeholders on campus in forwarding climate-friendly food systems?

	7. What is the most feasible way of measuring impacts that we are having, and boost community that is participating in these initiatives? 8. Does UBC have guidelines available where students can go to for climate-friendly foods?

3. Closing Remarks and Thank you!

APPENDIX A.2 - MARCH 15, 2022 INTERVIEW

AGENDA

1. Quick introductions and recap from focus group
2. Overview of our LFS 450 project & approval for consent. Notes will be taken on this information as a part of our primary data collection, and incorporated into our final report and oral presentation.
3. Summary of our project
4. Guiding Questions (approx. 5 minutes each, including follow-ups):
   a) What are the best ways to reduce UBC's food-related emissions?
   b) We are aware that UBC has great climate change/GHG emissions related strategies within their food system, such as the increase in plant-forward/based options, the sustainability icon initiative to show the sustainability of the meal/food being purchased, etc. Based on your experience working with UBC Food Services, how receptive have students been to these initiatives and which ones? What do you think could be improved within UBC's food system to increase these efforts, and do you think that anything could be changed?
   c) What would you consider to be the largest barriers preventing UBC students from developing more climate-conscious, sustainable habits?
      i) Last week you mentioned education, but is there anything else that we should consider?
   d) Some institutions that have adopted plant-forward initiatives within their menu-planning have noticed a decrease in their financial expenditure for food. On the other hand, many people seem reluctant to purchase plant-forward options due to their presumed higher price point. Considering that almost half of all students have experienced food insecurity at some point in their life at UBC, are you aware of any discrepancies in the financial accessibility of plant versus animal-based options?
   e) A lot of research demonstrates that procuring organic foods is a major way to reduce overall environmental impacts. How much of UBC's food procurement is organic? Would you agree that organic is a solid solution to GHG-related concerns?
   f) Are there any municipal/provincial initiatives and/or policies that have helped and/or prevented UBC from taking considerable food-related climate action? Additionally, are there barriers created by the university or other faculties that have created roadblocks in significant projects?
   g) What can UBC do to strengthen BC's regional/local food systems?

5. Wrap-up and thank you!

APPENDIX A.3 - MARCH 22, 2022 INTERVIEW

AGENDA

1. Quick introductions and recap from last week's focus group
2. Overview of our LFS 450 project & approval for consent. Notes will be taken on this information as a part of our primary data collection, and incorporated into our final report and oral presentation.
3. Summary of our project
4. Guiding Questions (approx. 5 minutes each, including follow-ups)
    a) In your opinion, what is the highest impact area that UBC should be focusing on in order to reduce its food system related GHG emissions? We've noticed this answer is usually reflective of one's area of expertise (e.g. food preparation, waste management, etc.), so we'd like to hear your take!
    b) Besides statistics from Our World in Data on GHG emissions associated with specific foods, do you have access to any data that accurately and recently reflects the GHG emissions associated with UBC's food system?
    c) From what you know, what has the UBC community achieved to date when it comes to reducing emissions and implementing climate action initiatives surrounding the mitigation of GHG emissions?
        - How can the UBC community make improvements to the existing collaboration occurring between various stakeholders in order to expedite our action towards tackling climate change and reducing GHG emissions?
    d) In what ways has UBC fulfilled the targets set out in the 2030 UBC's Climate Action Plan? For example, how have on-campus food system actions worked towards reaching GHG milestones?
        - What are some of the barriers that impede UBC's food system partners from making the desired transition towards sustainability?
        - In what ways has SEEDS Sustainability Program helped in achieving those goals?
    e) In your opinion, how aligned are UBC and UBC Food Services with the goals of the current CAP and recent UBC Climate Emergency Declaration?
    f) Besides seasonality, locality, and type of food (e.g. plant versus animal-based)what are some other major contributors of purchasing high emission GHG foods?
    g) What can students do to best accommodate these shifts?

5. Wrap-up and Thank you!

APPENDIX B - PRIMARY DATA RAW RESULTS

APPENDIX B.1 - MARCH 11, 2022 FOCUS GROUP RAW DATA

Item	Notes
General question: What are the most relevant key indicators that a university can assess to understand its food-related procurement impact? **n=13**	– Local – Carbon footprint – Volume of food waste/waste – GHG emissions – Biodiverse – Seasonal – Just – Climate-friendly – circular/zero waste – Proportion of sustainable food to unsustainable food – % of food waste reduction, % of meat reduction – Equity measures (i.e., vis a vis sourcing) – % of food sourced locally – Carbon footprint, waste reduction → GHG emissions – % of edible food waste – % of total food coming from vegetable products
Breakout Room 1 **n=3**	**1. From a climate mitigation perspective, what are the top & most innovative actions the university could take through its food procurement policy that can contribute to assessing and reducing GHG emissions (e.g. reducing food waste, encouraging plant-based meals)?** – Locality/seasonality – Source local – Plant-based aspects – % & $ of waste of different food categories (i.e., animal proteins, plant-based, cost of waste, dairy, produce, etc.) **2. How we can make these strategies and incentives more accessible for students?** – Cultural shifts required – Thinking long term – So much change, people that are more willing to adapt in a resident dining situations, it takes time to make the choices easy – Large amount of people still want chicken strips and meat-based options – Education/food literacy **3. What are the best ways to measure the impact of these actions?** – Requirement to measure waste – Reporting food waste

	– Sharing the data with people – Week on week/month on month **4. What do you currently know about UBC's food procurement practices, where should we be focusing in terms of highest impact?** – Animal proteins (beef specifically) – Taking a granular, going through the procurement categories, bold moves for the university – Grains, that rely on water/nitrogen for example – Alternative of beverages – Promising practices in food municipalities – Packaging **5. How can a robust management framework be put in place to support climate-friendly mitigation?** – Group on UBC Food Charter – Having important values and guidance – Involving an association of UBC Food and Beverage Operators **6. What is the most feasible/reasonable approach in implementing a valuable strategy?** – Steady – Not going 0 → 100 – Finding nice number – Pushing a feasible/reasonable number to nudge people to move them in climate-friendly practices – "If you build it, they will come" **7. How can we shift attitudes regarding plant-forward alternatives in practice?** – Use a lot of data, looking at sales – See what is selling – Specifically how much every day – Vancouver has a more receptive audience (not 100%) **8. How much of the food at UBC is procured locally?** – Last report at 54%, including processed
Breakout Room 2 **n=3**	**1. What do you think is the best way to advance sustainable food procurement at UBC?** – Financial and environmental, UBC could think about practices lower GHG emissions or footprint indicators while keeping its commitment to UBCFS being viable to business goals – More plant-based (triple win, better for the planet, humans, and is more affordable) – Educate students for students to choose plants more often **2. What is the most effective way of promoting plant-based meals?** – Lots of strategies

	– Nudge campaigns – Have at all restaurants – Abundant at all stations – Sampling, making great tasting foods – Just as thought out as any other dishes – Not calling things vegan/vegetarian, giving appealing ways – Icons to identify vegan/vegetarian – NORMALIZING IT – Eating more plants is a good thing **3. Any other successful practices across other institutions?** – Extreme: healthy beverage initiative → a year with no sugar-sweetened beverages – You only have plant-based foods (pros and cons of this approach) – Is this feasible? Is it infringing on people's freedom? – If it is feasible anywhere, it's at UBC – Nutritious foods rank higher as a priority than environmentally friendly foods – – Program if you purchase 10 healthy meals, 1 will be free. – Incentive, you purchase 5 healthy/plant-based choices, and 1 free – Take a smaller margin on plant-based dishes and higher margin on the less environmentally friendly foods/meals **4. What is the effectiveness of mock meats/vegan chicken nuggets?** – Not a huge fan – Processed foods, that don't contain animal proteins – Focus more on plant-based dishes that are not heavily processed – Gateway food for typical carnivores – "Tomorrow foods": ingredient deck is much cleaner than other options **5. Is UBC doing anything to quantify or measure food impacts?** – Measure purchases of animal proteins and veggies – 2018 was the first year that spent more on fruits and veggies compared to meats – Have always measured food waste, but will be now recording GHG emissions – Audit of menu offerings, and see what % is plant-based across all services **6. What is UBC doing to assess GHG emissions other foods?** – Nothing recently, but are starting to – Climate-friendly food label – Food waste measurement – UBC has been a leader in sustainability – Impacts of food have been ignored – Carried out quantification of menu items at Merchante through food label – Having information readily available is the hardest step – But work is being introduced – Emission factors that are specific for UBC's food procurement practices are not being measured right now **7. Is it considered that local is always better, or are there foods that are**

	better to procured not local? – Yes, local is the goal – Science doesn't always prove that though – Impacts of purchasing local through Sauder project, showed that there were better environmental impacts from purchasing not locally – Holistically, food is better when procured closer to the consumer as possible – Especially, when focusing solely GHG impacts, it might be better to procure certain foods elsewhere – It's about finding a balance – Like justice, and other points – We spend about 12-14 million$ on food procurement, supporting local suppliers
Breakout Room 3 **n=3**	**1. What is the best way to reduce GHG emissions at UBC's food system?** – plant-based diet promotion – Reducing waste – Reducing waste from preparation, and after consumption – Address refrigeration – Nitrous oxide, is incredibly potent, is used all along food supply chain – Some refrigeration leaked on campus → assessing and understanding where we can make refrigeration more sustainable – Carbon reporting – Air conditioning – Refrigeration are most abundant **2. Do you have a hierarchy of most important facets to tackle first?** – Food waste – Plant-based – Campaigns that reduce food waste and plant-based – Circular food systems can tackle both things **3. What is a good method of promoting plant-based foods and reducing food waste?** – Reducing waste: food salvaging (i.e., using foods that aren't the prettiest, or using components that are considered waste alternatively) – Appeal of plant-based foods is pretty low, so what are the offerings? – I think they are delicious, but not always represented in the offerings **4. How can we make plant-based more accessible?** – Plant-based can be less expensive – Let's take a pasta bar: if you're getting a vegetarian pasta over a meat pasta, there are no big price differences in both – The food system is upheld by subsidies – Put a cost on the more carbon-heavy foods – Visual way of which food has less carbon footprint **5. Are you aware of other sustainable food procurement practices in an institutional setting?**

	– Municipal/university examples – UBC operates much like a city – Jurisdiction is tricky, to universities and/or cities? – Lots of different case studies in other municipalities **6. What is the best way of involving the most amount of stakeholders on campus in forwarding climate-friendly food systems?** – COVID made it difficult to 'gather around food' – 'Zoomed out' of having social food gatherings – Long table dinner all down main mall, showcasing climate-friendly food – Producers can showcase ecosystem services – 'Meet your maker' – Celebrate local champions **7. What is the most feasible way of measuring impacts that we are having, and boost community that is participating in these initiatives?** – Monitor value and emissions that are being saved – Quantitative number of impact – It's not mandatory to report – Methodology is not there yet, not prescribed by the government, need to report from start to end of the food system – Quantifying impacts, it's not inclusive of all considerable groups – Careful about indicators we use, ideally, something representing holistically, not just – As a consumer, interested in the interim steps, want to know that process is being made – Sign about what one foodservice location is taking – Challenge with big wicked problems is seeing some kind of progress, showing the consumer what the progress is **8. Does UBC have guidelines available where students can go to for climate-friendly foods?** – 'Bike-to-work week' – 'SDG weeks' – Difficult to communicate what you're doing – Communications challenge – Sustainability Hub → Dashboard

APPENDIX B.2 - MARCH 15, 2022 INTERVIEW DATA

1. **As a general opening question, in your opinion, what is the best way to reduce GHG emissions within UBC's food system?**

– Move to plant-forward menus
– More organic food and less-factory farmed food

2. **We are aware that UBC has great climate change/GHG emissions related strategies within their food system, such as the increase in plant-forward/based options, the sustainability icon initiative to show the sustainability of the meal/food being purchased, etc. Based on your experience working with UBC Food Services, how receptive have students been to these initiatives and which ones? What do you think could be improved within UBC's food system to increase these efforts, and do you think that anything could be changed?**

– Students are receptive and drivers of these changes through advocacy work
– Also students are the vocal minority
    - Most of the population is keen to eat as much meat as possible
    - 2-3 meals per day
– Students can drive the change but need to create actionable change
    - Menu engineering
    - Culinary skills around plant-based diets
    - Culinary training on plant based cooking
    - More education around why eating more plant based is important for public and planetary health
– What can be improved
    - Anything that drives both commitment to certain amount of plant based proteins on behalf of UBC and an education campaign

3. **What would you consider to be the largest barriers preventing UBC students from developing more climate-conscious, sustainable habits?**
    a. **Last week you mentioned education, but is there anything else that we should consider?**

– Want people to want more plants
– Strategies that are more fiscally motivated are met with more friction
– In many parts of world, plant-based diets are more common, and others have larger meat diets
– Financially motivating people, by making unhealthy foods less accessible

    b. **Would it be better to de-incentivize meat consumption (e.g. taxing meats) as opposed to incentivizing plant foods?**

– Incentivizing plants, focusing on the positives is a habit that should be changed
– Shaming people's bad behaviors isn't very effective

4. **Some institutions that have adopted plant-forward initiatives within their menu-planning have noticed a decrease in their financial expenditure for food. On the other hand, many people seem reluctant to purchase plant-forward options due to their presumed higher price point. Considering that almost half of all students have experienced food insecurity at some point in their life at UBC, are you aware of any discrepancies in the financial accessibility of plant versus animal-based options?**

– A lot of people think that plant based is more expensive

    - Not necessarily the case
    - Challenge = factory farmed food is cheap to produce if you look at end price and not holistic cost of food
- Try to make food in-house and from scratch rather than processed foods
    - Adds to the cost
    - Need to balance
- People think that meat based entree has more value since they get more protein, not really true
    - Plant also provides protein source
    - Dieticians need to educate chefs and students about protein content
- Buy better quality plants than meat or chicken or seafood
    - UBC can afford to get veggies from the farm rather than local grass fed meats
    - Best quality ingredients in our kitchens are plant based
- Seasonality of plants
    - plants have a seasonality with high and low pricing
    - Availability of fresh produce does not align with academic season too well
        - Pickling, preserving, canning to offer in the winter
        - Choose high quality frozen veggies
    - Ability to provide cheaper plant based proteins than animal based

5. A lot of research demonstrates that procuring organic foods is a major way to reduce overall environmental impacts. How much of UBC's food procurement is organic? Do you agree that organic is a solid solution to GHG-related concerns?

- Agrees about the organic vs conventional environmental impacts
- Conventional is actually super unconventional
- Organic food costs more because of lack of chemicals.
- Producing organic food can also occur through high volume businesses (can have a cumulatively high impact)
- We should be sourcing from smaller-scale farms --> pay people fair wages and produce higher quality foods
- We can't do more of it: the cost!... Student prices would be way too much.
- UBC hears that their food is too expensive, as is. Acknowledgement of students experiencing food insecurity.
- Not as prevalent as they should like it to be.
    - Everything that the UBC Farm purchases is organic (and what they produce)
    - Pay $12 mil for food in general, annually!

6. Are there any municipal/provincial initiatives and/or policies that have helped and/or prevented UBC from taking considerable food-related climate action? Additionally, are there barriers created by the university or other faculties that have created roadblocks in significant projects?

- Yes and no, mainly no. Main barrier is cost.
- What can the market bear? Need to acknowledge that our market is mostly students.
- Supply can be in issue --> sheer quantity of products that we purchase.
    - Caters towards the bigger picture food-system players.
- NO barriers other than health-related and cost barriers.
    - Eg. VCH bring you own container programs --> not food, but food waste and packaging associated with foods.
    - Pre-pandemic, were working with institutions to change the ministry of health's idea to bring in their own container.
    - UBC vouching for modernizing our food system.

    - Regulations around food recovery/donation (safely).
- MINISTRY OF FISHERIES AND AGRICULTURE:
    - Initiatives to support local food production and procurement.
    - "Feed BC program" with post-secondary institution connection, and healthcare.
        - All commit to 32% local. (or 52?????)
        - Finding ways to support post secondary institutions to purchase more local foods.

7. Would you be able to share with us some indicators or datasets related to ghg emissions, % local, % plant based?

- Pre pandemic: 2019 numbers
    - $12-14 million a year on food and beverage
    - 62% sourced locally (400 km to the point grey campus)
    - Prioritize BC above the states for fruit and veg
    - 46% plant-based entrees in 3 residence dining halls (anything that could be considered a meal)
    - Setting a target for 60% for 2022 for plant-based

APPENDIX B.3 - MARCH 22, 2022 INTERVIEW DATA

1. **In your opinion, what is the highest impact area that UBC should be focusing on in order to reduce its food system related GHG emissions? We've noticed this answer is usually reflective of one's area of expertise (e.g. food preparation, waste management, etc.), so we'd like to hear your take!**

– Continuing to change menu offerings

2. **Besides statistics from Our World in Data on GHG emissions associated with specific foods, do you have access to any data that accurately and recently reflects the GHG emissions associated with UBC's food system?**

– Climate Action plan (2030)
– ~30,000 based on 2019
– Looking at food purchases → connecting quantity based on GHG emissions
– Later this year will show deeper food methodology of how we quantify food emissions
– Unlikely to include seasonal/local lens of foods (like tomatoes, whether they are BC or Mexican)
– Refer back to David on seasonality of foods

3. **From what you know, what has the UBC community achieved to date when it comes to reducing emissions and implementing climate action initiatives surrounding the mitigation of GHG emissions?**

– What's been achieved:
    - New menu offerings, new initiatives underway currently.
    - Should go to their twitter page, David, the website can give some good info
    - **Biggest: new CAP --> gives us the policy direction to go forth and set up new initiatives, such as guidelines for food procurement.
    - What can the students better to do help contribute to this?

    a. How can the UBC community make improvements to the existing collaboration occurring between various stakeholders in order to expedite our action towards tackling climate change and reducing GHG emissions?

    - We already have a FS action team --> CFFS group within that.
        - Collaboration with faculty staff, AMS, other climate groups.
        - We need to focus on our actions within the CAP, but we need to consider that this will evolve as we get towards our target within the next eight years.

4. **In what ways has UBC fulfilled the targets set out in the 2030 UBC's Climate Action Plan? For example, how have on-campus food system actions worked towards reaching GHG milestones?**

    a. What are some of the barriers that impede UBC's food system partners from making the desired transition towards sustainability?

    - CARBON: more metrics! We need systems that can build in carbon.
        - Eg. purchasing systems that have dollars --> need one for carbon to inform our decision making among our different food partners.
            - E.g. climate-friendly food vs climate unfriendly-food

    b. In what ways has SEEDS Sustainability Program helped in achieving those goals?

- CFF labeling project
- Behavioural, human choice side.
    - How do we make plant-based offerings more appealing??? (we can use literature to back this up)
    - We need more people to support these initiatives

5. **In your opinion, how aligned are UBC and UBC Food Services with the goals of the current CAP and recent UBC Climate Emergency Declaration?**
    - Very well aligned!
    - We've worked closely with food services on all of the work
    - If anything, food services has been working on this before UBC made the declaration or integrated it into our plan.

    INITIATIVES THAT HAVE BEEN SUCCESSFUL:
    - E.g. initiative to change the recipe for burgers (plant and meat combined to lessen the GHG impact).
    - Showcasing CF food and making it more attractive
    - MISSING: seeing how that specifically feeds into the CF food metrics.

6. **Besides seasonality, locality, and type of food (e.g. plant versus animal-based)what are some other major contributors of purchasing high emission GHG foods?**
- We focus on one currently, with core GHG metrics
- Not that his group is aware of specifically

7. **What can students do best to accommodate these shifts? Besides being open, educating themselves.**
- Culture shift
- Recognizing impacts of our activities, looking for more sustainable alternatives
- Awareness of plant-based term is becoming a much more social norm than it has been
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- Access to metrics?
- Climate change accountability report
    - https://sustain.ubc.ca/about/plans-policies-and-reports
    - Incorporating food in 2022 ^^
    - Climate emergency engagement website: https://climateemergency.ubc.ca/

APPENDIX C - THE ORGANIZATION CAN BE FOUND AT

HTTPS://WWW.DEFAULTVEG.ORG/#!/IMPLEMENT